

TECHNICAL NOTE NO. **TN95-6****U.S. ARMY APPROACHES TO MITIGATING
OCCUPATIONAL STRESS -- SYMPOSIUM PROCEEDINGS****PARTICIPATING ORGANIZATIONS:**

U.S. Army Research Institute of Environmental Medicine
Natick, Massachusetts 10760-5007

U.S. Army War College
Carlisle, Pennsylvania 17013

Meyer Friedman Institute
San Francisco, California 94115

Massachusetts General Hospital
Boston, Massachusetts 02114

Walter Reed Army Medical Center
Washington, D.C. 20307

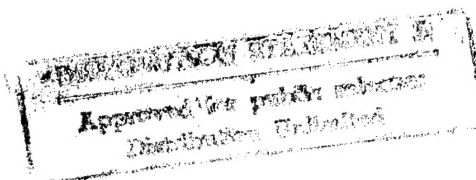
Walter Reed Army Institute of Research
Washington, D.C. 20307-5100

Veterans Affairs Medical Center
Boston, Massachusetts 02130

Edith Nourse Rogers Memorial Veterans Hospital
Bedford, Massachusetts 01730



JULY, 1995



**UNITED STATES ARMY
MEDICAL RESEARCH & MATERIEL COMMAND**

19950926 088

U.S. ARMY APPROACHES TO MITIGATING OCCUPATIONAL STRESS -- SYMPOSIUM PROCEEDINGS

M. A. Fischl, Symposium Chairman
Office of the Deputy Chief of Staff for Personnel
Headquarters, Department of the U.S. Army

Gerald P. Krueger, COL, Ph.D. U.S. Army Research Institute of Environmental Medicine,
Natick, Massachusetts 01760-5007

Paul T. Harig, COL, Ph.D. U.S. Army War College, Carlisle, Pennsylvania 17013

Virginia A. Price, Ph.D. Meyer Friedman Institute, San Francisco, California 94115

Maurizio Fava, M.D. and Andrew Littman, M.D. Massachusetts General Hospital, Boston,
Massachusetts 02114

Marvin Oleshansky, LTC, M.D. Walter Reed Army Medical Center, Washington, D.C.
20307

James N. Jackson, LTC and Joel M. Teitelbaum, Ph.D. Walter Reed Army Institute of
Research, Washington, D.C. 20307-5100

Jessica Wolfe, Ph.D. and Bruce Young, M.A. Veterans Affairs Medical Center, Boston,
Massachusetts 02130

William Mark, Chaplain, COL. Edith Nourse Rogers Memorial Veterans Hospital,
Bedford, Massachusetts 01730

Symposium Presented at the APA-NIOSH Conference
Stress in the 90s: A Changing Workforce in a Changing Workplace
Sponsored by The American Psychological Association
and

The National Institute of Occupational Safety and Health
Washington, D.C., 22 November 1992

For	
AI	<input checked="" type="checkbox"/>
ed	<input type="checkbox"/>
tion	<input type="checkbox"/>
<i>Perletter</i>	
tion/	
ality Codes	
all and/or	
Special	

A-1

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE 31 July 1995	3. REPORT TYPE AND DATES COVERED Technical Report	
4. TITLE AND SUBTITLE U.S. Army Approaches to Mitigating Occupational Stress - Symposium Proceedings			5. FUNDING NUMBERS	
6. AUTHOR(S) G.P. Krueger, P. T. Harig, V.A. Price				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) "See Attached"			8. PERFORMING ORGANIZATION REPORT NUMBER Technical Note No. _____	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Research Institute of Environmental Medicine Natick, MA 01760-5007			10. SPONSORING/MONITORING AGENCY REPORT NUMBER Technical Note No. _____	
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION/AVAILABILITY STATEMENT Approved for Public Release; distribution is unlimited			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words)				
14. SUBJECT TERMS			15. NUMBER OF PAGES	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT	

TABLE OF CONTENTS

<u>Symposium Papers and Sections</u>	<u>Page</u>
Executive Summary	1
Gerald P. Krueger. Environmental Medicine Guidance to Sustain Soldier Health and Performance During Deployment to Climatic Extremes	2
Paul T. Harig, Virginia A. Price, Maurizio Fava, Andrew Littman, and Marvin Oleshansky. U.S. Army War College Stress Management Program: Type A Behavior Reduction	13
James N. Jackson. Occupational Stress, Strain and Coping Among U.S. Army Practical Nurses	22
Jessica Wolfe, Bruce Young and William Mark. Fort Devens Operation Desert Storm Reunion Survey	36
Joel M. Teitelbaum. U.S. Army Supports to Prevent and Mitigate Family Dysfunction During Military Combat Deployment	51

The findings in this report are not to be construed as an official Department of the Army position, unless so designated by other authorized documents.

DTIC AVAILABILITY NOTICE

Qualified requesters may obtain copies of this report from Commander, Defense Technical Information Center (DTIC) (formerly DDC), Cameron Station, Alexandria, Virginia 22314.

DISPOSITION INSTRUCTIONS

Destroy this report when no longer needed.
Do not return to the originator.

EXECUTIVE SUMMARY

Occupational stress in the military is not limited to the stress of direct combat, nor to emotional stress. This technical note presents papers describing Army programs that address such physiological stressors as dehydration or frostbite, such life-style syndromes as "Type-A Behavior," and stresses felt by the family members of soldiers who deploy on combat missions. Also offered are discussions on combat and post-combat stress reactions experienced by various soldiers in our most recent major war, the Persian Gulf Conflict of 1991, and on the stresses germane to the environment in which military nurses work.

The papers were originally presented in a symposium on Stress in the 90s, jointly sponsored by the American Psychological Association and the National Institute of Occupational Safety and Health, in Washington, D.C., November, 1992. They are published here to afford broad dissemination of this sample of Army programs.

ENVIRONMENTAL MEDICINE GUIDANCE TO SUSTAIN SOLDIER HEALTH AND PERFORMANCE DURING DEPLOYMENT TO CLIMATIC EXTREMES

Gerald P. Krueger, COL, Ph.D.

U.S. Army Research Institute of Environmental Medicine
Natick, Massachusetts 01760-5007

INTRODUCTION

Rapid deployment of military forces to naturally harsh environments presents combatants with physiological, biological, and psychological stresses that (1) affect mood, motivation, and activation; (2) result in decreased job performance; (3) make accidents more likely; (4) lead to illnesses and non-battle injuries; and (5) jeopardize mission success. Research at the U.S. Army Research Institute of Environmental Medicine aims to preserve health, sustain and maximize performance of soldiers, sailors, and airmen, during training, operational readiness exercises, and combat. Preventive medicine programs concentrate on soldiers' physiological and psychological readiness to perform work in climatic and environmental extremes. Laboratory and field research develop countermeasures to assist military forces in adjusting to hot dry desert, hot wet jungle, cold arctic regions, and high terrestrial altitudes. Proven preventive medicine techniques and advanced concepts for deployment preparation include pre-acclimatization, anti-jet lag measures, hydration, selection of rations based on nutrition requirements, pharmacological intervention, field sanitation, work-rest-sleep scheduling, and controlling operational stresses. This paper is a synopsis of preventive medicine guidance principles offered to military leaders for deployment.

DEPLOYMENT GUIDANCE

Jet Lag. Aerial troop deployment necessitates coping with "jet lag." Transmeridian flights rapidly change the phase of the light/dark cycle. Work-rest schedules, in effect, are switched from days to evenings or nights, before the body's 24-hr internal biological clock adjusts to the different time zone. Resultant desynchronization of circadian physiological and behavioral rhythms usually involves several days of fatigue, sleepiness, lethargy, insomnia, gastrointestinal disorders, and poor mental agility and performance.

Jet Lag Countermeasures. Just prior to troop transport departure, deploying military personnel usually spend many hours working at logistical tasks, making final combat readiness preparations. They are thus deprived of adequate rest and sleep, and often board deployment flights already fatigued. Ideally, operational planning should include the following jet lag countermeasures:

- o Several days before departing, soldiers should be told to set wristwatches to destination time and begin living, eating meals and sleeping according to the anticipated destination schedule. Sleep loss contributes to jet lag, thus soldiers should sleep on aircraft. Moderate use of sleep aids, such as hypnotics, may be helpful to ensure sleep on troop transport aircraft.

- o Upon arrival at destination, soldiers should stay awake until normal bed time for the new time zone. Daytime naps should be used sparingly because they make it difficult to sleep at night and thereby prolong the body's adjustment to the new time zone. Physical exercise in the sunlight of day helps the body to adjust to the new time zone.

- o Known principles of bodily circadian rhythms should be used to plan schedules for creation of "night-fighter" teams expected to sleep by day and fight by night. Adjustment to new work schedules ("shift-lag") is as detrimental to performance and well-being as jet lag, is more difficult to manage, and lingers longer because of constant shift changes.

Desert Deployment. Soldiers who live in temperate environments face several hazards upon deployment to a harsh desert. They need to be protected from heat and

sun, but also dangerously cold winds in winter. Soldiers must be as prepared to keep warm at night as they are to keep cool in the day. Hazardous blowing dust and sand cause asthma attacks, chafing and skin infection, and eye irritation and infection. Heat strain and heat illness are the biggest risk to soldiers working in hot environments (hot dry and hot wet).

Desert Countermeasures. Operational planning should recognize the following:

- Soldiers should attain peak physical fitness and heat acclimatization prior to deployment. Significant acclimatization can be attained in 4-5 days; full acclimatization takes 7-14 days of 2-3 hours per day of exercise in the heat. Physically fit troops acclimatize more rapidly than those less fit. Military units on alert for deployment should immediately optimize the physical training program and state of heat acclimatization (i.e., spend more time exercising in heat).

- After deployment to a desert, soldiers should maintain adequate levels of physical fitness. Programs for maintenance of fitness should be tailored to the environment.

- Sufficient clothing and personal equipment should be brought for protection against heat, sun, wind, cold, and wet. Clothing, uniforms, cover, hats, head cloths, goggles, sunscreen, and sunglasses should be used to protect against sun and wind.

- Soldiers should be retrained in field sanitation practices, emphasizing health threats of native food and water, and stressing insect control.

- Soldiers tend not to eat enough in the desert. Leaders must ensure rations are consumed and soldiers' body weights are maintained. A moderate salt increase may be useful initially but thereafter, the sodium in issued rations should be sufficient.

- Commanders are to give emphasis to proper management of work-rest cycles, and to maintaining adequate water consumption. Leaders should watch soldiers carefully for signs of distress in the heat and adjust schedules, work rates, rest, and water consumption according to weather conditions.

o Water is a primary tool for maintaining individual performance, health, and hygiene in the desert. Soldiers should be reminded that dehydration is possible without signs of thirst, and performance degrades slowly without being recognized. Sweat rates during work in desert heat can reach 1.5 qts/hr. Anticipate drinking 3-4 gallons of water per every 12-hr work day during the summer. Soldiers must not become complacent; they should be reminded to drink water before they work, and before they become thirsty. Urine monitoring increases awareness of hydration. Soldiers should drink often in order to replace water lost to sweat, and should maintain enforced drinking throughout the period of deployment.

o Recurrent rest periods, or working at a slower pace or in shaded, cooler places help minimize body heat production. For heat strain prevention, adjust physical activity levels and work-rest rates according to the mission and prevailing environmental conditions.

Arctic Deployment. The ability to maintain body temperature within a narrow range is also important in the cold. Loss of body heat leads to cold injuries. General lowering of body temperature results in hypothermia, and local freezing of body tissues can lead to frostbite. Wind-chill effects pose a greater danger to immobile soldiers than to exercising or working soldiers. When uniforms are wetted by sweat, an immobile soldier is particularly threatened by wind chill. Prolonged exposure of feet in cold water causes immersion foot or trench foot injuries, and both are serious problems for dismounted troops operating in cold marshy areas. Dry and windy conditions at high altitude or in the desert keep drinking water requirements high even when it is cold. Dehydration increases the risk of cold injury and contributes to discomfort in cold.

Countermeasures to the Cold. Preventive measures for the cold include the following:

o Soldiers must have enough clothing and shelter to keep warm and be adequately equipped for exposure to cold. Loose, layered, dry clothing should be worn, as all enhance the insulating value for the body. Layers of clothing allow easy adjustment for comfort. Soldiers should regularly change clothes, should completely dry and warm their feet, and regularly change their socks, especially wet socks, 2-3 times per day.

- o Direct effects of the wind should be avoided. Use dry, windproof clothing and natural or artificial barriers as wind breaks. Minimize exposed skin areas. Covering the head keeps one warmer.

- o If shivering, soldiers should do something to warm themselves, such as put on more clothing, use large muscles to generate internal heat or, if that does not seem to help, seek assistance from others in getting warm before hypothermia takes over.

- o Providing warm food and drinks at night before sleep helps keep soldiers warm and boosts morale. Adequate drinking and food reduces susceptibility to cold-wet injury. Plan shortened periods of sentry duty to allow soldiers the opportunity to get warm.

Deployment to High Terrestrial Altitude. "Lowlander" troops deploying to much higher terrestrial altitudes (e.g., mountains) encounter a decrease in atmospheric pressure as they ascend to higher altitude. Although the proportion of oxygen in the air is constant (20.9%), decreased atmospheric pressure results in a proportional reduction of partial pressure of oxygen in the air, and lowers the rate at which oxygen diffuses into the blood, which leads to hypoxemia. This reduces oxygen to the brain, working muscles, and other parts of the body, and leads to profound effects on sensory processes, mentation, sleep, and physiological work capacity. If soldiers do not ascend to altitude slowly, gradually acclimatizing to decreased atmospheric pressure, they will experience mountain sickness, which may develop into three serious medical problems:

- o **Acute mountain sickness (AMS).** Rapid ascent to higher altitude produces headache, light-headedness, loss of appetite, sleeplessness, lassitude, nausea, vomiting, and general malaise. The faster one ascends to very high altitude, the more likely he/she will be affected by AMS.

- o **High altitude pulmonary edema (HAPE).** Upon ascent to substantially higher altitudes, lung capillaries become leakier in response to hypoxia. Blood plasma, forced into the lungs during exercise, interferes with oxygen transport, rendering the victim severely hypoxemic and greatly compromising the capillaries. Unless treated by quick descent to lower altitude, lungs continue to fill until the victim gets too little oxygen to survive.

o **High altitude cerebral edema (HACE).** With increased pressure in the skull, onset of HACE is indicated by mental confusion, slurred speech, or uncoordinated gait; it can develop rapidly, include hallucinations, ataxia, sleepiness, paralysis, coma, and death.

Other environmental stressors at high terrestrial altitude include cold, wind, dryness, and solar and ultraviolet radiation. Because of loss of appetite at high altitude, soldiers do not eat as much, and body nutrition is then affected. High altitude cold and extreme physical activities dramatically increase caloric demands and may require special nutrients.

Altitude Countermeasures. Acclimatization begins almost immediately with an increased ventilatory rate to elevate oxygen concentration in the blood stream. Other physiological mechanisms increase efficiency of oxygen transport and utilization at altitude. Most of these are well-developed within 1-2 weeks.

o AMS, HAPE, and HACE can be prevented by ascending slowly, on foot, to 3000 m, and then climbing less than 500 m at a time, allowing 1 or 2 days to acclimatize at each altitude. Shuttling equipment components for the next higher camp up 300-500 m over a day or two, but returning to sleep at a lower camp each night ("climb high, sleep low") takes advantage of this gradual acclimatization method.

o Supplemental oxygen, acclimatization, staging by slow ascent to high altitude, and selected medications like acetazolamide (a carbonic anhydrase inhibitor), dexamethasone (anabolic steroid), and tyrosine (a precursor of the neurotransmitter norepinephrine) can all serve roles in adapting to high altitude.

o A balanced diet at high altitude would include 52% carbohydrates, 33% fats, and 15% proteins. Carbohydrates are preferred to fats since carbohydrates replace depleted muscle glycogen and require less oxygen for metabolism. Extra vitamins and up to 5 liters of water per day may be required.

Sustained Performance Demands. Modern combat dramatically increases the likelihood of continuous military operations (CONOPS). Sustained work without proper rest and sleep usually results in declined alertness and compromises in performance, especially mental performance involving initiative, integration of information, planning, plan

execution, and quick responses. Such continuous operations raise concern for the quality of combatant performance, a high incidence of accidents, and the emotional health and well-being of overworked participants.

Strategies for sustaining performance in CONOPS. Military organizations should staff their units with sufficient numbers of trained personnel to do the mission (i.e., to provide personnel redundancy to allow rotation of shift-work teams through various work positions, especially in such high cognitive workload areas as communications, command and control, support, and logistics). Night-shift teams must be identified and trained for night operations, and their day-time sleep needs must be accommodated.

- Tasks should be modified to minimize effects of sleep loss. Team members should be cross-trained to do each other's jobs; overlearned tasks are less subject to sleep loss effects.

- Soldier loads, both physical and mental, should be deliberately lightened to preserve strength over long work bouts.

- Careful assignment of work-rest schedules, planning and adhering to a sleep discipline policy, especially for leaders who are prone to ignore their own sleep needs, and judicious use of napping when it is safe to do so can assist in preventing performance decrements.

- Between combat pulses, permit sufficient length of recovery sleep to restore alertness and recharge motivation.

CONCLUDING REMARKS

The above general principles, drawn from years of laboratory and field research at the U.S. Army Research Institute of Environmental Medicine (USARIEM), can serve as useful preventive medicine guidance for military planners, tacticians, and especially small unit leaders preparing to lead soldiers, sailors and airmen into harsh climatic environments

to prepare for combat. Further elaboration of each of the above points can be obtained by using the USARIEM references listed at the end of this report.

REFERENCES

Bandaret, L.E. and Burse, R.L. Effects of high terrestrial altitude on military performance. In: Handbook of Military Psychology. R.G. & A.D. Mangelsdorff (Eds.) Wiley, London: 233-253, 1991.

Burr, R.E. Heat illness: A handbook for medical officers. Natick, MA: U.S. Army Research Institute of Environmental Medicine, Technical Note TN 91-3, 1991.

Burr, R.E. Medical aspects of cold weather operations: A handbook for medical officers. Natick, MA: U.S. Army Research Institute of Environmental Medicine, Technical Note TN 93-4, 1993.

Burr, R.E., Modrow, H.E., King, N., Lipton, R.E., Stanek, S.A., Stroschein, L.A., Sawka, M.N., Rock, P.B., and Young, A.J. (Eds.) Sustaining soldier health and performance in Haiti: Guidance for small unit leaders. Natick, MA: U.S. Army Research Institute of Environmental Medicine, Technical Note TN 94-4, 1994.

Comperatore, C.A. and Krueger, G.P. Circadian rhythm desynchronization, jet lag, shift lag, and coping strategies, In: Occupational Medicine, State of the Art Reviews: Shiftwork, V5, No. 2. Hanley & Belfus, Philadelphia: 323-341, 1990.

Cymerman, A. and Rock, P.B. Medical problems in high mountain environments: A handbook for medical officers. Natick, MA: U.S. Army Research Institute of Environmental Medicine, Technical Note TN 94-2, 1994.

Glenn, J.F., Burr, R.E., Hubbard, R.W., Mays, M.Z., Moore, R.J., Jones, B.H. and Krueger, G.P. (Eds.) Sustaining health and performance in the desert: A guide to environmental medicine for operations in Southwest Asia. Natick, MA: U.S. Army Research Institute of Environmental Medicine, Technical Note TN 91-1 and 91-2, 1990.

Jones, B.H., Rock, P.B., Sawka, M.N., Modrow, H.E., Lindsay, G.C., Petruccielli, B., Mays, M.Z., O'Mara, M.A., Young, A.J., Stroschein, L.A., and Krueger, G.P. (Eds.) Sustaining soldier health and performance in the former Republic of Yugoslavia: Guidance for small

unit leaders. Natick, MA: U.S. Army Research Institute of Environmental Medicine, Technical Note TN 93-6, 1993.

Krueger, G.P. Sustained military performance in continuous operations: Combatant fatigue, rest and sleep needs, In: Handbook of Military Psychology. R. Gal & A.D. Mangelsdorff (Eds.) Wiley, London: 255-277, 1991.

Krueger, G.P. Environmental medicine research to sustain health and performance during military deployment: Desert, arctic, high altitude stressors. Journal of Thermal Biology, 18: 687-690, 1993.

Kobrick, J.L. and Johnson, R.F. Effects of hot and cold environments on military performance, In: Handbook of Military Psychology. R. Gal & A.D. Mangelsdorff (Eds.) Wiley, London: 215-232, 1991.

Modrow, H.E., Burr, R.E., Jones, B.H., Mays, M.Z., Rock, P.B., Sawka, M.N., Petruccelli, B., Matthew W.T., Murphy, T.C., King, N., Hursh, S.R., Lindsay, G.C. and Krueger, G.P. (Eds.) Sustaining soldier health and performance in Somalia: Guidance for small unit leaders. Natick, MA: U.S. Army Research Institute of Environmental Medicine, Technical Note TN 93-1, 1992.

Sawka, M.N., Roach, J.M., Young, A.J., Modrow, H.E., Reardon, M.J., Jones, B.H., Petruccelli, B., and Rock, P.B. (Eds.) Sustaining soldier health and performance in Operation Support Hope: Guidance for small unit leaders. Natick, MA: U.S. Army Research Institute of Environmental Medicine, Technical Note TN 94-3, 1994.

Thomas, C.D., Baker-Fulco, C.J., Jones, T.E., King, N., Jezior, D.A., Fairbrother, B.N., Speckman, K.L. and Askew, E.W. Nutritional guidance for military field operations in temperate and extreme environments. Natick, MA: U.S. Army Research Institute of Environmental Medicine, Technical Note TN 93-8, 1993.

Young, A.J., Roberts, D.E., Scott, D.P., Cook, J.E., Mays, M.Z. and Askew, E.W. Sustaining health and performance in the cold: Environmental medicine guidance for cold

weather operations. Natick, MA: U.S. Army Research Institute of Environmental Medicine,
Technical Note TN 92-2 & 93-2, 1992.

U.S. ARMY WAR COLLEGE STRESS MANAGEMENT PROGRAM: TYPE A BEHAVIOR REDUCTION

Paul T. Harig, COL, Ph.D.

U.S. Army War College
Carlisle, Pennsylvania 17013

Virginia A. Price, Ph.D.

Meyer Friedman Institute
San Francisco, California 94115

Maurizio Fava, M.D. and Andrew Littman, M.D.

Massachusetts General Hospital
Boston, Massachusetts 02114

Marvin Oleshansky, LTC, M.D.

Walter Reed Army Medical Center
Washington, D.C. 20307

INTRODUCTION

In spite of efforts to reduce it, some people have more psychological stress than others. After accounting for common adversity, negative life events, or minor daily hassles, some are hindered by their personal styles, quirks and vulnerabilities, which engender greater stress and amplify their problems (Cotton, 1990). These individuals are *stress-prone*, breeder reactors of distress in trying situations. Their characteristics include an inability to relax without feeling guilty; habitual overplanning of leisure time; perfectionist tendencies; impatience with delays, with interruptions or with those who respond slower than expected; a chronic sense of time urgency and a motivational drive to work at a faster pace, often with a compulsion to overwork; involvement in multiple projects with many deadlines; an excessive competitive drive; an inability to be happy with one's accomplishments; and polyphasic thinking (multiple thoughts, a tendency to interrupt or rush the pace of conversation, and poor active listening).

Stress-prone people share the features that Friedman and Rosenman (1974) termed the "Type A" pattern in clinical studies of behavioral risk factors to coronary heart disease (CHD). Meyer Friedman, the cardiologist responsible for this classification beginning in the late 1950s, defined Type A Behavior as an "action-emotion complex," a pattern built on arousal, impatience, anger and easily triggered irritability (Friedman & Rosenman, 1974). These tendencies may lead to maladaptive social adjustment and negative biobehavioral effects. Butcher, Graham, Williams and Ben-Porath (1990) found that spouses of high Type A men described them as significantly more likely to have temper tantrums, act bossy, argue over minor things, become upset by unexpected events, and act irritable, critical, angry and tense. Recently, Williams' Laboratory at Duke Medical Center (Williams, Suarez, Kuhn, Zimmerman & Schanberg, 1991; Suarez, Williams, Kuhn, Zimmerman & Schanberg, 1991) confirmed evidence for chronic Sympathetic Nervous System activation in Type As, as well as the interaction between the Type A behavior pattern, total serum cholesterol, and hostility on cardiovascular and neurohormonal response. This suggests that the high Type A person pays for sympathetic arousal with his/her health.

In past research, the Type A pattern showed an adverse relationship with chronic diseases associated with stressful lifestyles or exacerbated by stress. High levels of this behavior pattern were judged by a National Institute of Health review panel to be of the same magnitude of relative risk for CHD as elevated levels of systolic blood pressure, serum cholesterol and smoking (The Review Panel on Coronary-Prone Behavior and Coronary Heart Disease, 1981). Yet, the critical pathogenic factors in this association have been more elusive because of differences in research methodology and the multifactorial nature of CHD, which makes it difficult to isolate risk factors with universal effects.

It is not surprising that the bulk of research efforts have focused on the behavior-disease connection rather than on the modification of the Type A pattern itself. However, reduction of Type A stress-prone tendencies is a worthwhile goal regardless of the correlation to the disease's end-points. Arguably, the enrichment of a person's life that results from improved family and work relationships is justification alone to reduce the Type A pattern in stress-prone individuals.

Prior research has demonstrated both health and interpersonal benefits result from modification of the Type A pattern. Friedman, Thoresen, Gill, et al. (1986) dramatically demonstrated that altering Type A behavior reduces cardiac morbidity and mortality in post-infarction patients. In contrast to the control individuals involved in group cardiac counseling, 592 participants who received the Type A behavioral counseling program not only attenuated this behavior but reduced their cumulative 4.5-year cardiac recurrence rate to less than half of the expected level.

ARMY WAR COLLEGE'S TYPE A STRESS REDUCTION PROGRAM

In 1984, Friedman et al.'s behavioral counseling program was replicated in a group of apparently healthy, middle-aged male volunteers attending the U.S. Army War College. Working with senior military officers who were enrolled in a year-long postgraduate program, Friedman and his associates demonstrated a marked or profound reduction in Type A behavior in 41.9% of participants in this nine-month counseling program, in contrast to only 8.9% in untreated control groups (Gill, Price, Friedman, et al., 1985). Moreover, those subjects who reduced their Type A behavior also exhibited significant reductions in their total serum cholesterol relative to those who had not changed. Friedman also demonstrated that there were no deleterious effects on leadership skills among the counseled participants, although there was significant collateral improvement in their family situations as reported by spouses.

Army War College students are the pool for future senior leadership positions in the U.S. Armed Forces. They comprise several hundred colonels and promotable lieutenant colonels selected by their service to attend an intensive 10-month curriculum of postgraduate studies in strategic leadership and national security studies. Army War College graduates receive recognition for achieving the U.S. Army's highest level of professional military education. Stress management programs such as Type A counseling are continually offered to students who score high in Type A characteristics during structured interviews. This program is available to these individuals in support of the leadership development goals of the Army War College. Approximately 50 officers have participated each year since 1983.

The immediate objectives of the Army War College for participants in the Type A reduction program are the following:

- o Learn to recognize and monitor one's own Type A behaviors,
- o Understand the health hazards associated with chronic exhibition of Type A behavior, and recognize its negative effects on mental state, interpersonal relationships and career possibilities,
- o Integrate the relaxation response, systematic self-observation and daily practice of behaviors incompatible with Type A,
- o Manage anger and hostility and develop more effective ways to handle events, people and frustrations that trigger these responses,
- o Enhance family skills and options for handling domestic triggers of stress and anger,
- o Recognize the importance of maintaining positive control over an inner sense of well-being and self-esteem.

The Army War College program is built on a cognitive social learning model (Price, 1982). This model postulates that Type A behavior is an outgrowth of the way individuals view themselves and their world, and the set of personal beliefs about this relationship, which fosters a variety of fears or anxieties that promote and sustain dysfunctional behavior. Consequently, efforts to reduce the Type A behavior pattern by focusing exclusively on the behaviors themselves have not been effective (Roskies, 1990) because these beliefs appear to get in the way of sustained behavior change (Price, 1982). Hence, the program addresses the need to examine and, if possible, change these belief systems as a way to effect permanent reduction in Type A behavior.

Price (1982) proposes that three personal beliefs are at the core of the Type A pattern:

(1) One's worth is assailable and constantly must be proven, which leads to the fear of being judged as not having sufficient worth, and, therefore, not valued or loved.

(2) There is no orderly, causal relationship between moral behavior and its long range outcomes, which engenders a fear that good may not prevail and that good actions can produce aversive consequences.

(3) Life is a "zero sum" game in which resources are scarce and "your gain is my loss," leading to the fear that there will be an insufficient supply of resources necessary to maintain personal well-being.

According to the proposed model, the Type A behavior pattern centers around the belief that one needs to prove oneself or that one is not yet worth enough, which is expressed in the compulsive, achievement-oriented behavior of Type A.

Recent evaluation of the Army War College program determined that participants change in both psychological and physiological parameters. Fava, Littman, Halperin, et al. (1991) studied participants using a battery of psychological and physiological tests before and after the program. Following Type A intervention, participants displayed a significant reduction in average daily caloric intake and levels of perceived stress, anxiety, hostility, depression, psychological distress and Type A behavior, compared to officers who scored lower on Type A ratings and did not participate in treatment. After a 13-session program consisting of regularly scheduled 90-minute meetings over a period of seven months, Type A men were compared to peers who had not attended the counseling sessions. Before and after the program, study subjects were assessed with instruments measuring "behavioral" (Type A behavior, diet and leisure-time physical activity) and "psychological" (perceived stress, anxiety, depression, and hostility) correlates of risk for cardiovascular disease. All participants underwent a videotaped structured interview (VSI) in accordance with the Friedman method to measure Type A behavior (Friedman & Powell, 1984). A trained interviewer, who was blind to the participants' group status, conducted and scored the VSI. Before the intervention, the Type A men who were significantly higher than their peers on their VSI score ($p=.004$) were also significantly different on measures of self-reported global stress ($p=.004$), and self-ratings of recent anxiety ($p=.04$), depressed mood ($p=.05$), somatic symptoms ($p=.02$) and hostility ($p=.004$).

Fava et al. (1991) found no differences between groups on post-treatment measures. The reduction in the scores of anxiety, depression, hostility and psychological distress reported by the treatment group was significant when compared to a slight increase in these symptoms reported by the comparison group over the same period. Prior to treatment, the intervention group subjects displayed significantly higher levels of global Type A behavior on the VSI. However, following completion of the stress/Type A reduction program, the groups did not differ significantly from each other on their VSI scores. These data suggest that the program is followed by marked psychological and behavioral changes by the participants.

Because of non-random assignment and significant pre-treatment differences in Fava et al.'s groups, one cannot rule out the possibility that the substantial changes in the Type A/stress reduction group were a statistical illusion of differential regression to the mean (Cook & Campbell, 1979). To check this effect, the study was repeated on another Army War College class (Harig & Price, unpublished) using matched controls and the VSI scores for comparison. In this study, the comparison group consisted of men who had scored as high as their treatment group counterparts on global measures of Type A behavior but elected not to attend the counseling sessions. On measures of Type A behavior, the treated subjects were statistically lower on blind VSI ratings conducted in the post-treatment phase, with strongest group differences on the Type A subcomponent "time urgency" ($p < .001$), similar to changes demonstrated in Fava et al.'s study. This suggests that the reduction of behavioral and psychological symptoms identified in earlier studies may be a consequence of the intervention.

The Fava group also studied observable changes in hormonal risk factors for coronary artery disease (CAD) corresponding to comparative improvement in psychosocial factors discussed above (Littman, Fava, Halperin, et al., 1993). While this research is still in the preliminary stages, the most intriguing discovery concerns changes in the levels of dehydroepiandrosterone-sulfate (DHEA-S), an adrenal androgen found to be independent of other traditional risk factors for CAD, yet inversely related to the death rate from CAD in prospective studies (Johnson, Ramey & Ramwell, 1977; Barrett-Connor, Khaw & Yen, 1986). Despite a lack of pretreatment differences, the posttreatment difference in DHEA-S became significant ($p < .01$) due to a small increase in the Type A/stress reduction group

and a marked decrease in the comparison group. Previous studies showed that DHEA-S steadily decreases per year of life (Orentreich, Brind, Rizer & Vogelmann, 1984). The treatment groups' increase in DHEA-S was opposite of what one would anticipate. This suggests there might be possible improvement in relative risk for atherosclerosis due to the Type A/stress reduction program. However, this conclusion must be interpreted with caution in light of the limitations inherent in the study design, as well as the need for additional confirmatory research.

CONCLUDING REMARKS

In addition to the objective findings reported here, there have been numerous testimonials from Army War College counseling program alumni and their spouses that attest to the benefits of a program focused on altering their stress-prone lifestyle. One wrote, "I have my life back." A graduate of the 1987 program reflects, "The greatest benefit to me concerning this program was realizing what I was doing to keep myself fired-up over inconsequential problems; further, learning the techniques for keeping me from getting emotionally involved." Many alumni described how these changes significantly improved their leadership style. Another graduate wrote, "I was able to discover that my staff was fully capable of responding to an emergency situation. I found that I didn't have to go 'high order' to motivate them to do their jobs." Spouses also reflected the change. The wife of a 1986 graduate wrote, "I am delighted that he was chosen to participate in this program. To live with a man who was so driven truly kept our family in a nervous, tense, hurried-life mode all the time...I know living with him made me Type A myself." It appears, therefore, that at the very least, the program is producing healthy effects by successfully interrupting a chain that, if otherwise unbroken, may link personal distress to premature disease.

REFERENCES

- Barrett-Connor, E., Khaw, K.T. and Yen, S.S.C. A prospective study of dehydroepiandrosterone sulfate, mortality, and cardiovascular disease. New Engl J Med, 315: 1519-1524, 1986.
- Butcher, J.N., Graham, J.R., Williams, C.L. and Ben-Porath, Y.S. Development and Use of the MMPI-2 Content Scales. University of Minnesota Press, Minneapolis, 1990.
- Cook, T.H. and Campbell, D.T. Quasi-Experimentation. Houghton-Mifflin, Boston, 1979.
- Cotton, D.H.G. Stress Management, An Integrated Approach to Therapy. Brunner/Mazel, New York, 1990.
- Fava, M., Littman, A., Halperin, P., et al. Psychological and behavioral benefits of a stress/Type A behavior reduction program for healthy middle-aged army officers. Psychosomatics, 32: 337-342, 1991.
- Friedman, M. and Rosenman, R.H. Type A Behavior and Your Heart. Knopf, New York, 1974.
- Friedman, M. and Powell, L.H. Diagnosis and quantitative assessment of Type A behavior: Introduction and description of the videotaped structured interview. Integrative Psychiatry, 2: 123-129, 1984.
- Friedman, M., Thoresen, C.E., Gill, J.J., et al. Alteration of type A behavior and its effect on cardiac recurrences in post myocardial infarction patients: Summary results of the recurrent coronary prevention project. Am Heart J, 112: 653-665, 1986.
- Gill, J.J., Price, V.A., Friedman, M., et al. Reduction in type A behavior in healthy middle-aged American military officers. Am Heart J, 110: 503-14, 1985.
- Harig, P.T. and Price, V.A. Unpublished.

Johnson, M.E., Ramey, E. and Ramwell, P.W. Androgen-mediated sensitivity in platelet aggregation. Am J Physiol, 232: H381-H385, 1977.

Littman, A.B., Fava, M., Halperin, P., et al. Physiological benefits of a stress reduction program for healthy middle-aged army officers. J Psychosom Res, 37: 345-354, 1993.

Orentreich, N., Brind, J.L., Rizer, R.L. and Vogelmann, J.H. Age changes and sex differences in serum dehydroepiandrosterone sulfate concentrations throughout adulthood. J Clin Endocrinol Metab, 59: 551-555, 1984.

Price, V.A. Type A Behavior Pattern, A Model for Research and Practice. Academic Press, New York, 1982.

The Review Panel on Coronary-Prone Behavior and Coronary Heart Disease. Coronary-prone behavior and coronary heart disease: A critical review. Circulation, 63: 1199-1215, 1981.

Roskies, E. Type A Intervention: Where do we go from here? In: Type A Behavior. [Special issue]. Strube, M.J. (Ed.) Journal of Social Behavior and Personality, 5: 419-438, 1990.

Suarez, E.C., Williams, R.B., Kuhn, C.M., Zimmerman, E.A. and Schanberg, S.M. Biobehavioral basis of coronary-prone behavior in middle-aged men. Part II: Serum cholesterol, the Type A behavior pattern, and hostility as interactive modulators of physiological reactivity. Psychosom Med, 53: 528-537, 1991.

Williams, R.B., Suarez, E.C., Kuhn, C.M., Zimmerman, E.A. and Schanberg, S.M. Biobehavioral basis of coronary-prone behavior in middle-aged men. Part I: Evidence for chronic SNS activation in Type As. Psychosom Med, 53: 517-527, 1991.

OCCUPATIONAL STRESS, STRAIN, AND COPING AMONG U.S. ARMY PRACTICAL NURSES

James N. Jackson, LTC

Walter Reed Army Institute of Research
Washington, D.C. 20307-5100

INTRODUCTION

The purpose of this survey study was to explore the relationship between occupational stress and occupational-related strain among U.S. Army active duty military and civilian practical nurses in a single hospital setting, and the extent to which this relationship is mediated by coping. Despite mounting evidence that hospitals are high-stress work environments, occupational stress research in the field of health care has focused almost exclusively on professional personnel and registered nurses in particular. The National Institute of Occupational Safety and Health (NIOSH) studied the relative incidence of mental health disorders in 130 major occupational categories to provide an empirical basis for identifying and selecting specific occupations for further research into the relationship between job stress and worker health (Colligan, Smith and Hurrell, 1977). The study indicated a disproportionately high incidence of mental health disorders among workers in hospital/health care occupations. Although practical nurses in the NIOSH study ranked third in terms of the incidence of mental health disorders, little is known about the pervasiveness of mental health problems among practical nurses and the extent of their threat to health care delivery, or about the precise nature of the antecedents of these problems. A review of the literature suggests little research has been directed at the various levels of the medical hierarchy (including practical nurses), or into the relationship between occupational stress and worker health among corresponding occupational groups.

The survey study reported here defined stress as a transactional process that occurs between the person and the environment (Gitterman and Germain, 1979; Bartlett, 1970). This differs with other definitions of stress that are phrased solely in terms of the

occurrence of events consensually regarded as stressful (Holmes and Masuda, 1964), or in terms of responses that are sometimes the consequence of stress, such as physiological mobilization (Selye, 1976), cognitive disruption (Horowitz, 1976), or behavioral disruption (Gitterman and Germain, 1979). Stress requires a judgment that environmental and/or internal demands tax or exceed a person's resources for managing them. This judgment and the person's efforts to manage and shape the stress experience are conceptualized in terms of two interacting processes: "appraisal" and "coping" (Lazarus and Folkman, 1982).

Appraisal, the evaluative process that imbues a situation with meaning for the person, is the judgment that a transaction is either irrelevant to our well being, benign in its implication, or stressful. Stressful appraisals (e.g., occupational stress) give rise to an evaluation of coping options and constraints. This evaluation is influenced by previous experience in similar situations, generalized beliefs about oneself and the environment, and the availability of personal and environmental resources (Wrubel, Benner and Lazarus, 1981). Coping refers to efforts to manage environmental and internal demands, and conflicts among demands. The outcome of these two interacting processes of appraisal and coping is conceptualized as "strain" (Millon, Green and Meagher, 1982). Strain refers to the impact of stress on the biopsychosocial health of the person.

LITERATURE PERSPECTIVES

In the absence of previous stress research on practical nurses, other tangentially related literature on professional nurses and other medical occupational groups was reviewed. The tendency of investigators to define what is stressful about nursing severely limited the number of studies in which the nurse was asked to ascribe meaning to his/her work experience. Those aspects of nursing regarded as stressful include nursing management, intensive care nursing, and evening/rotating shifts.

With the emergence of internally consistent measures, workers' reports about many aspects of occupational stress have proven useful in evaluating this phenomenon. Numerous occupational stress variables studied showed substantial correlations with strain variables. They include role ambiguity, role conflict, inadequate support from superiors,

quantitative overload or underload, degree of control over work processes, responsibility for people, participation in decision-making, incongruity between worker and job, and physical characteristics of the work environment.

A considerable variety of worker pathologies have been attributed to occupational stress. These include mental illnesses, cardiovascular diseases, high blood pressure, counterproductive behaviors, substance abuse, somatic complaints, disrupted sleep, sexual maladjustment, peptic ulcer, and general diffuse sickness. Over the past decade, it has been increasingly acknowledged that health outcomes are a product of coping rather than simply a consequence of the presence or absence of stress. Other relevant variables studied in relation to health outcomes include age, gender, and ethnicity, but such research has not been conclusive. A striking deficiency is the lack of adequate discussion of the differential predictive powers of the various components of occupational stress and coping with regard to strain. There is an obvious need for more studies in this area.

METHODOLOGY

The objectives of this study were (1) to determine whether coping was a significant mediator or buffer of occupational stress effects, (2) to determine the differential predictive powers of the various components of occupational stress and coping with respect to occupational-related strain, and (3) to determine whether objectively defined aspects of occupational stress (military versus civilian affiliation, work roles, work settings, and work shifts) accounted for significant differences in occupational-related strain. This exploratory, descriptive, and predictive study was conducted using an *ex post facto* correlational design. On the basis of knowledge about occupational stress and coping, a regression equation was developed to predict occupational-related strain. As a means of controlling extraneous factors that may have influenced the prediction, a number of demographic variables were included in the design as suppressors: age, gender, race, marital status, and number of years employed as a practical nurse.

Questionnaire respondents were drawn from a population of practical nurses at a large U.S. Army general hospital. Stratified and systematic sampling procedures were

used to compile a representative sample. Three intervally scaled instruments developed by Osipow and Spokane (1983) and a brief questionnaire to collect demographic and related characteristics of the respondent generated the data. Data on the dependent variable "Occupational-Related Strain" originated from the Personal Strain Questionnaire (PSQ). Data on the independent variable "Occupational Stress" were obtained via the Occupational Environment Scales (OES). Data on the mediating variable "Coping" were generated via the Personal Resources Questionnaire (PRQ). Respondents were mailed a packet containing a cover letter, a volunteer agreement affidavit, a PSQ, an OES, a PRQ, and a return envelope.

Returns from 62 of the 134 practical nurses contacted established a 46.3% rate of return for the study. These responses represented the collective voice of 27.6% of the hospital's practical nurse population.

MAJOR FINDINGS AND IMPLICATIONS

The primary objective of this investigation was to determine whether coping was a significant mediator or buffer of occupational stress effects. This objective was met through the use of a hierarchical regression analysis in which occupational stress and coping were employed as predictors of occupational-related strain while controlling for the effects of age, gender, race, marital status, and the number of years employed as a practical nurse. The results of the analysis are listed in Table 1. The magnitude of the respective beta weights signified the strength of the relative contributions of each predictor to the prediction of occupational-related strain. Despite being found moderately significant, coping (-.285) lacked sufficient power to buffer the effects of occupational stress (.477).

The above finding was interpreted to mean the respondents reacted more to the potential for harm or loss than they did to the potential for gain in stressful work situations. The fear associated with their harm/loss appraisal kept them so continuously mobilized for struggle that it foreclosed their ability to cope. It was not enough that they possessed competent coping skills; they also needed to believe in them (Bandura, 1977). This finding is consistent with those of Caplan, Cobb, French, Harrison, and Pinneau (1975) who, after studying social support as a moderator of stress effects, concluded that no buffering effect

was present. Moreover, the inclusion in this study of a much wider constellation of coping activities yielded similar results, which would appear to further reject the plausibility of a buffering hypothesis. Rejection of the buffering hypothesis implies continued victimization of the respondents by a stressful work environment. That is, if the structure of their work environment is not changed administratively, then it is unlikely they will be able to muster their personal resources to deflect or otherwise cope with occupational stress.

Table 1
Hierarchical Regression of the PSQ with Age, Gender, Race, Marital Status,
Years Employed, PRQ and OES

Variable	Multiple R	R ²	R ² Change	Simple R	B	Beta	F
Age	.216	.047	.047	-.216	-.560	-.192	1.528
Gender	.235	.055	.009	.061	.129	.248	4.396
Race	.236	.056	.001	.009	-.532	-.103	1.091
Marital Status	.244	.060	.004	.121	-.593	-.117	1.004
Years Employed	.308	.095	.035	-.042	.811	.238	2.567
PRQ Full Scale	.543	.294	.200	-.488	-.285	-.237	4.630*
OES Full Scale	.715	.511	.216	.681	.477	.573	23.868*
(Constant)					.703		
*p < .05 with 1/54 df							

The second objective of this study was to determine the differential predictive powers of the various components of occupational stress and coping with respect to occupational-related strain, because of their potential to provide insight into the relationship among these important variables. This objective was met by treating the OES, the PRQ, and the PSQ like self-contained regression equations. Subscale scores thus became predictors of their respective full-scale scores. Each instrument was analyzed using a forward regression procedure.

Analysis of the OES revealed that 61% of the variance in the full-scale score was accounted for in the Role Boundary Subscale, which measured the extent to which

respondents reported experiencing conflicting role demands and loyalties at work (see Table 2). Thus, the Role Boundary Subscale was the best predictor of occupational stress. This finding was interpreted to mean that what the respondents found most stressful about their work environment was (1) a lack of clarity about, and respect for, established lines of authority, which often resulted in more than one person directing their work activities, and (2) that they were not made to feel like important contributors to the overall enterprise of providing quality medical care.

The second best predictor of occupational stress was the Role Overload Subscale, which measured the extent to which respondents reported job demands in excess of personal and institutional resources. The Role Overload Subscale accounted for 22% of the variance in the full-scale score. This finding was interpreted to mean that the respondents felt taxed by a workload they feared could exceed both personal and institutional resources.

Together, these two findings underscore the anecdotal sentiments of many paraprofessionals employed by large professional organizations. Their work experiences are largely determined by professionals who decide how they will be managed, what their workload responsibilities will be, and the extent to which they will be recognized and appreciated for their contributions. The practical nurses who participated in this study were supervised by other practical nurses with more seniority. The reality of the work environment was that registered nurses and physicians orchestrated many of their work activities, often without the consent or knowledge of their supervisors. In spite of their coping competence, the practical nurses exercised little control over what happened to them on the job, rendering themselves defenseless against ill-conceived/circumvented management policies, and benign neglect on the part of hospital professionals. Lack of control over work processes, job conflict, and nonparticipation are all linked to mental health strains (Singer, 1975; Caplan, Cobb, French, Harrison and Pinneau, 1975; Hammer and Tosi, 1974; Quinn and Shepard, 1974). The findings imply that to reduce occupational stress for practical nurses, those things that give rise to role boundary and role overload concerns must be changed administratively. While it may not be feasible to redistribute the workload where there are staff shortages, employers should (1) insist established lines of authority not be violated, and (2) make greater creative use of employee recognition programs to reward dedicated service and achievement.

Table 2
Summaries of Forward Regression of the OES Full Scale with Role Overload,
Role Insufficiency, Role Ambiguity, Role Boundary, Responsibility and Physical Environment

Variable	Multiple R	R ²	R ² Change	Simple R	B	Beta	F
Role Boundary	.779	.606	.606	.779	.101	.245	1047.6*
Role Overload	.908	.824	.217	.719	.102	.228	1003.5*
Role Ambiguity	.945	.893	.070	.753	.103	.192	671.5*
Role Insufficiency	.970	.940	.047	.689	.100	.293	2078.3*
Responsibility	.983	.967	.027	.511	.102	.232	1302.7*
Physical Environment	.999	.998	.032	.740	.955	.246	1121.6*
(Constant)					-.123		
*p < .05 for 1/55 df							

Analysis of the PRQ determined that the best predictor of coping was the Recreation Subscale, which measured the extent to which the respondents reported making use of, and deriving pleasure from, regular recreational activities (see Table 3). The Recreation Subscale accounted for 65% of the variance in the full-scale score. This finding was interpreted to mean that the respondent relied most heavily on recreational and leisure activities as a means of coping with occupational stress.

The second best predictor of coping was the Rational/Cognitive Coping Subscale, which measured the extent to which respondents reported possession and use of cognitive skills in the face of work-related stresses. The Rational/Cognitive Coping Subscale accounted for 17% of the variance in the full-scale score. This finding was interpreted to mean that the practical nurses resorted to cognitive problem solving in response to problems associated with their patient care responsibilities over which they had control (e.g., dealing with difficult patients, responding to emergencies, and caring for the dying patient).

Table 3
Forward Regression of the PRQ Full Scale with Recreation, Self-Care,
Social Supports and Rational/Cognitive Coping

Variable	Multiple R	R ²	R ² Change	Simple R	B	Beta	F
Recreation	.807	.651	.651	.807	.101	.338	3401.0*
Rational/ Cognitive Coping	.907	.822	.170	.741	.992	.019	2728.2*
Social Supports	.964	.929	.108	.713	.100	.013	5796.4*
Self-Care	.999	.999	.070	.725	.966	.017	3415.1*
(Constant)					.703		
*p < .05 with 4/57 df							

These two findings provide further evidence that the consequences of appraisal depend upon the context in which the appraisal occurs (Bandura, 1977). Practical nurses were able to sense their own effectiveness within the context of patient care. Given that problem solving is predicated largely through knowledge, experience, and confidence, their potential for success was high. On the other hand, the practical nurses sensed their own vulnerability within the context of organizational conflict. Attempts at problem solving were inept in the absence of mastery, therefore they resorted to a more passive means (recreation) of combating stress engendered by organizational conflict.

These findings imply that coping competence can be dealt a debilitating blow if frequently called upon in the wrong context (Wrubel, Benner and Lazarus, 1981). Thus, it is an oversimplification to assume that one can adopt stress management techniques that will prove to be stress-reducing in all contexts. Administrative intervention is required to reduce organizational conflict. These findings go beyond those of previous studies to highlight the mechanics of coping in the absence of organizational support.

The Psychological Strain Subscale of the PSQ measured the extent to which respondents reported psychological adjustment and/or mood problems. This subscale was the best predictor of occupational-related strain (see Table 4), and accounted for 87% of

the variance in the full-scale score. This finding provides important new evidence that an unsatisfactory work environment can contribute to either the initiation or persistence of psychological problems. The finding is also consistent with those of Singer (1975), Caplan, Cobb, French, Harrison and Pinneau (1975); Hammer and Tosi (1974); and Quinn and Shepard (1974).

Table 4
Summary of the Forward Regression of the PSQ Full Scale with
Vocational Strain, Psychological Strain, Interpersonal Strain and Physical Strain

Variable	Multiple R	R ²	R ² Change	Simple R	B	Beta	F
Psychological Strain	.932	.868	.868	.932	1.000	.350	99.9*
Physical Strain	.973	.947	.079	.897	1.000	.357	99.9*
Interpersonal Strain	.990	.980	.034	.842	1.000	.235	99.9*
Vocational Strain	1.000	1.000	.020	.791	1.000	.197	99.9*
(Constant)					.146		
*p < .05 with 4/57 df							

The third objective of this study was to determine whether objectively defined aspects of occupational stress (affiliation, work roles, work settings, and work shifts) accounted for significant differences in occupational-related strain. This objective was met through the use of null hypothesis testing and one-way analysis of variance in which affiliation, work roles, work settings, and work shifts were each utilized as independent variables and pitted against occupational-related strain as the dependent variable (see Tables 5-8). The null was retained in each instance due to the insignificance of the F-ratio. These findings were not consistent with those of previous studies of registered nurses wherein significant differences had in fact been found. This implies that findings derived from studies of registered nurses have little applicability where practical nurses are concerned. These findings were also interpreted to mean that the seemingly undifferentiated levels of occupational-related strain among all strata of practical nurses

are a function of a universally perceived lack of caring and support within the work environment.

Table 5
One-Way Analysis of Variance: Affiliation and Occupational-Related Strain

Source	D.F.	Sum of squares	Mean squares	F-ratio	F-prob.
Between Groups	1	1577.314	1577.314	2.466	.122
Within Groups	60	38371.668	639.528		
Total	61	39948.982			
Note: The F-ratio is not significant at $p < .05$.					

Table 6
One-Way Analysis of Variance: Work Roles and Occupational-Related Strain

Source	D.F.	Sum of squares	Mean squares	F-ratio	F-prob.
Between Groups	2	248.441	124.221	.185	.832
Within Groups	59	39700.539	672.891		
Total	61	39948.980			
Note: The F-ratio is not significant at $p < .05$.					

Table 7
One-Way Analysis of Variance: Work Settings and Occupational-Related Strain

Source	D.F.	Sum of Squares	Mean Squares	F-ratio	F-prob.
Between Groups	1	32.228	32.228	.048	.827
Within Groups	60	39916.756	665.279		
Total	61	39948.984			
Note: The F-ratio is not significant at $p < .05$.					

Table 8
One-Way Analysis of Variance: Work Shifts and Occupational-Related Strain

Source	D.F.	Sum of Squares	Mean Squares	F-ratio	F-prob.
Between Groups	3	2755.397	918.466	1.432	.243
Within Groups	58	37193.586	641.269		
Total	61	39948.983			
Note: The F-ratio is not significant at $p < .05$.					

CONCLUSION

This study contributes to an empirically based understanding of the relationship between occupational stress, strain, and coping by providing further evidence of the role played by coping in the prediction of health outcomes. The investigation was unique in that it examined a previously unstudied population, one which carries important health care responsibilities. From an industrial perspective, the investigation established important baseline data for considering potential changes at both the policy and practice levels. At the policy level, patterns of supervision, communication, and division of workload can now be reviewed in light of the data generated by this study. At the practice level, the data could conceivably spur the development, shift the focus, or reinforce programmatic responses to the problem of occupational stress. The findings imply a comprehensive transactional approach is needed to generate hard data on circumscribed problems and populations, to develop consultative strategies aimed at making the workplace more supportive of the people that work there, and to design treatment for dysfunctional personnel.

The findings of this investigation are an indictment of the perceived lack of caring and practical nurses. However, it must be remembered that the generalizability of the results of this investigation are limited by (1) the self-selective aspects of the study sample and population, (2) the small size of the sample, and (3) the tendency on the part of the respondents to play down the negative aspects of their work, and to make themselves appear healthy and in control.

REFERENCES

Bandura, A. Self-Efficacy: Toward a unifying theory of behavioral change. Psychol Rev, 84: 191-215, 1977.

Bartlett, H. The common base of social work practice. National Association of Social Workers, New York, 1970.

Caplan, R.D., Cobb, S., French, J.R.P. Jr., Harrison, R.V. and Pinneau, S.R. Jr. Job demands and worker health: Main effects and occupational differences. Washington, D.C.: U.S. Government Printing Office, DHEW (NIOSH) Publication No. 75-160, 1975.

Colligan, M.J., Smith, M.J. and Hurrell, J.J. Occupational incidence rates of mental health disorders. J Human Stress, 3: 34-39, 1977.

Gitterman, A. and Germain, C. The life model of social work practice, In: Social work treatment: Interlocking theoretical approaches. (2nd ed.) F.J. Turner (Ed.) The Free Press, New York, 1979.

Hammer, W.C. and Tosi, H. Relationship of role conflict and role ambiguity to job involvement measures. J Appl Psychol, 59: 497-499, 1974.

Holmes, T.H. and Masuda, M. Life change and illness susceptibility, In: Stressful life events: Their nature and effects. B.S. Dohrenwend and B.P. Dohrenwend (Eds.) Wiley, New York, 1964.

Horowitz, M. Stress response syndromes. Aronson, New York, 1976.

Lazarus, R.S. and Folkman, S. Coping and adaptation, In: The handbook of behavioral medicine. W.D. Gentry (Ed.) Guilford, New York, 1982.

Millon, T., Green, C. and Meagher, R. (Eds.) Handbook of clinical health psychology. Plenum, New York, 1982.

Quinn, R.P. and Shepard, L. The 1972-73 quality of employment survey. University of Michigan Survey Research Center, Ann Arbor, 1974.

Singer, J.N. Job strain as a function of job and life stresses. Dissertation Abstracts International, 1975, 36(6B), 3109B.

Wrubel, J., Benner, P. and Lazarus, R.S. Social competence from the perspective of stress and coping, In: Social competence. J. Wine and M. Smye (Eds.), Guilford, New York, 1981.

FORT DEVENS OPERATION DESERT STORM REUNION SURVEY

(PRELIMINARY RESULTS)

Jessica Wolfe, Ph.D. and Bruce Young, M.A.

Veterans Affairs Medical Center
Boston, Massachusetts 02130

William Mark, Chaplain, COL

Edith Nourse Rogers Memorial Veterans Hospital
Bedford, Massachusetts 01730

INTRODUCTION

This report describes data collected from a cohort of 3,000 U.S. Army Active Duty, Reserve, and National Guard Persian Gulf War (Operation Desert Shield/Storm [ODS]) veterans who have been followed, since an initial survey was administered within five days of their return to the United States after the Gulf War in 1991 (Time 1). Approximately 18-24 months after the initial readjustment survey, veterans were reevaluated (Time 2) to assess the general well-being of the returning troops, their combat exposures, and their life coping skills. It is vital for any nation's military to understand these effects on soldiers, for the battlefield is the workplace of the soldier. The 1992 follow-up study, like the original survey, included standardized measures of exposure to stress, mental and physical health, as well as extensive demographic information. In comparing follow-up data to those of the initial study, we hoped to outline the predictors of adequate postwar adjustment and to explore the course of posttraumatic stress disorders (PTSD) within this veteran population.

FOLLOW-UP SURVEY (TIME 2)

The follow-up sample was representative of the initial group of soldiers surveyed in terms of demographics and combat exposure (see Charts 1-3). The follow-up sample was overwhelmingly Caucasian (86%) and male (91%). Most were married (53%), ranked below commissioned officer level (94%), and made careers as manual laborers (35%) or military personnel (36%). Women were more likely to be single (56%).

The Time 2 sample overrepresented National Guardsmen (41%) to some extent, particularly in comparison to the Time 1 sample. The Time 2 sample also contained significantly fewer nonwhites and was older overall than the group that, to date, has not responded to the second survey (see Table 1). Women in the Time 2 sample reported more combat exposure and scored higher on the Mississippi scale for combat-related PTSD (Keane, Caddell, and Taylor, 1988) at the time of the initial survey than did their nonresponding counterparts. The Time 2 sample was otherwise not significantly different from the Time 1 group.

FINDINGS

In terms of follow-up findings, it is notable that soldiers generally recalled greater exposure to combat stressors at Time 2 than they did during the first survey (see Chart 3). Men received significantly higher totals on the Laufer combat exposure scale (Gallop, Laufer, and Yeager, 1981) at the one-year follow-up, while both genders scored higher on an expanded 33-item scale geared specifically towards ODS experiences (Wolfe and Mark, 1991). In addition, respondents were prompted to identify their most significant ODS stressor during both phases of the survey: at Time 1, soldiers most commonly reported combat events (30%), domestic issues (22%), and intraunit conflicts (13% for men and 20% for women); and at Time 2, they mentioned anticipated life threats (23% for men and 34% for women), intraunit conflicts (22% for men and 30% for women), or a lack of stressors (18% for men and 0% for women), suggesting a distinct change in perceptions (see Chart 4).

Surveyed troops also indicated poorer mental adjustment at Time 2. Scores on the Mississippi scale, for example, increased over time for both men and women (see Chart 5). For men, the Global Severity Index of the Brief Symptom Inventory (Derogatis and Melisaratos, 1983) also rose substantially during the interim between surveys. It is important to note that women showed a similar trend; in fact, the GSIs increased by approximately 25%. We suspect that the statistical nonsignificance of this effect is largely due to the relatively small number of women tested, as is the observation that Laufer scores did not differ for women between the two surveys.

Chi-square analyses indicated a significant change in Mississippi PTSD scores and BSI Global Severity Index between Time 1 and Time 2 (see Charts 6 and 7). Using accepted clinical cut-off scores, the percentage of people above the clinical cut-off for PTSD (Mississippi score) and GSI (BSI) significantly increased for both men and women. For males, the percentage above clinical cut-off on the Mississippi went from 3.3% (i.e., 2.2%+1.1%) to 9.0% (i.e., 2.2%+6.8%); for women, the percentage went from 16.7% (i.e., 13.0%+3.7%) to 26% (i.e., 13.0%+13.0%).

The study found subjective assessments of ODS service changed dramatically over the period of the two surveys. Soldiers overall remembered less adequate preparation, less national support, less concern with environmental conditions and mail, and a greater sense of threat at Time 2 (see Table 2). They also noted less performance satisfaction, greater need for assistance with symptoms of stress, and less interest in seeking help from religious sources. Women in particular perceived poorer preparation and weaker national support at Time 2.

The relationship between the increase in reports of combat exposure and the decline in mental health is unclear. Analyses showed that subjects who reported a significant increase in combat exposure and in Laufer scores were more likely to report recalling traumatic life events in the Gulf. Individuals who scored in the clinically significant range for the Mississippi or BSI Global Severity Indices also stated that they had experienced more intervening traumatic life events. The correlation between changes in combat exposure measures and changes in mental health indices generally remained low (in the .1-.2 range).

CONCLUSION

This report represents results from data collected on 25-30% of the total cohort sampled at Time 2. Analyses on the total Time 2 group (n=2315) are currently in progress and will be reported elsewhere. Currently, we have initiated Time 3. This phase includes in-depth, face-to-face interviews of a selected subsample of ODS veterans who represent both high and low extremes of stressor exposure, and physical and psychological health. With this additional longitudinal data, we will be able to tap, with increasing accuracy, the most critical predictors of postwar adjustment among ODS veterans.

Chart 1
Demographic Characteristics of Time 2 Sample
(Percentages)

	Total (n=611)	Males (n=557)	Females (n=54)
Race			
White	85.6	85.8	83.3
Black	7.7	6.8	16.7
Hispanic	2.9	3.2	0.0
Other	3.8	4.2	0.0
Marital Status			
Married	53.4	55.9	27.7
Single	37.2	35.4	55.6
Divorced	6.4	5.9	11.1
Other	3.0	2.8	5.6
Military Status			
Active Duty	33.6	33.6	33.3
Reserve	22.9	21.8	40.7
National Guard	41.4	41.4	25.9
Civilian	2.1	3.2	0.0
Rank			
Enlisted	35.2	34.8	38.9
NCO	59.0	59.6	53.7
Officer	5.8	5.6	7.4
Occupation			
Professional	8.9	8.1	17.6
Administrative/Service	12.9	12.5	17.6
Manual	35.3	37.0	17.6
Military	35.7	35.1	41.2
Student	7.2	7.3	5.9

Chart 2
Personal Characteristics of Time 2 Sample

	Total (n=611)			Males (n=557)			Females (n=54)		
	M	SD	Range	M	SD	Range	M	SD	Range
Age	30.4	8.3	19-60	30.4	8.3	19-60	29.9	7.6	19-49
Years of Education	13.1	1.8	7-22	13.0	1.7	7-22	13.5	2.1	12-20
Months in Gulf	4.1	1.5	1-9	4.1	1.5	1-9	4.8	1.4	2-8

Chart 3
Changes in Perceived Combat Exposure

	Time 1		Time 2		t
	M	SD	M	SD	
ODS Exposure Total					
Males (n=556)	7.22	5.08	8.56	5.87	-8.09***
Females (n=54)	7.19	3.82	9.15	5.60	-3.42**
Total (n=610)	7.22	4.98	8.61	5.84	-8.76***
Modified Laufer Score					
Males (n=542)	2.99	2.16	3.43	2.34	-5.63***
Females (n=54)	2.70	1.55	3.10	2.15	-1.31
Total (n=596)	2.97	2.12	3.40	2.33	-5.73***
* p<.05 ** p<.01 *** p<.001					

Table 1
Characteristics of Time 2 vs. Time 1 Responders

Overall, Time 2 responders differ from nonresponders-to-date surveyed at Time 1 *only* in the following respects:

- The Time 2 sample includes a lower percentage of nonwhite responders than did the Time 1 sample, $X^2(1, n=611) = 4.08$, $p < .05$,
- The Time 2 sample overrepresents the National Guard with respect to active soldiers and reserves, $X^2(1, n=611) = 26.8$, $p < .001$.

Within the units surveyed to date at Time 2, the population of responders showed the following:

- A lower percentage of nonwhites than the group of nonresponders-to-date, $X^2(1, n=2951) = 10.7$, $p < .01$,
- A higher mean age than the nonresponders-to-date, $t(2802) = 2.67$, $p < .01$.

Within units surveyed at Time 2, female responders differed significantly from female nonresponders-to-date on Time 1 measures in that they did the following:

- Reported more total ODS combat exposure, $t(129) = -2.29$, $p < .05$,
- Received higher Laufer combat exposure scores, $t(128) = -2.11$, $p < .05$,
- Scored higher on the Mississippi scale, $t(129) = -2.08$, $p < .05$.

Chart 4
 ODS-Era Stressors Cited at Time 1 and Time 2
 (Percentages)

	Time 1		Time 2	
	Males	Females	Males	Females
Combat/Mission Activities	29.4	29.6	15.0	11.3
Noncombat Life Threats	8.6	1.9	8.5	9.4
Domestic Issues	22.4	22.2	6.8	13.2
Anticipated Life Threats	10.8	16.7	23.3	34.0
War Zone Attributes	5.4	1.9	5.7	1.9
Intraunit Conflicts	13.1	20.4	22.4	30.2
No Event	9.5	7.4	18.2	0.0

Chart 5
Changes in Reported Symptoms

	Time 1		Time 2		t
	M	SD	M	SD	
Combat Mississippi					
Males (n=555)	60.6	13.1	65.1	16.3	-7.81***
Females (n=54)	70.7	18.1	77.0	23.2	-2.47*
BSI - Grand Total					
Males (n=551)	20.9	24.6	25.0	30.0	-3.73***
Females (n=54)	38.9	37.8	48.1	48.8	-1.74
BSI - Global Severity Index					
Males (n=551)	.395	.465	.473	.568	-3.71***
Females (n=54)	.737	.716	.907	.921	-1.71
* p<.05 ** p<.01 *** p<.001					

Chart 6
Changes in Clinical Significance - Males Only

Mississippi Scale	Time 2	
	Above Cutoff	Below Cutoff
Time 1		
Above Cutoff	12 (2.2%)	6 (1.1%)
Below Cutoff	38 (6.8%)	499 (89.9%)
$X^2(1, n=555) = 75.4, p < .001$		

BSI - Global Severity Index	Time 2	
	Above Cutoff	Below Cutoff
Time 1		
Above Cutoff	81 (14.7%)	47 (8.5%)
Below Cutoff	73 (13.3%)	350 (63.5%)
$X^2(1, n=551) = 103.4, p < .001$		

Chart 7
Changes in Clinical Significance - Females Only

Mississippi Scale	Time 2	
	Above Cutoff	Below Cutoff
Time 1		
Above Cutoff	7 (13.0%)	2 (3.7%)
Below Cutoff	7 (13.0%)	38 (70.3%)
$X^2(1, n=54) = 15.1, p < .001$		

BSI - Global Severity Index	Time 2	
	Above Cutoff	Below Cutoff
Time 1		
Above Cutoff	15 (27.8%)	3 (5.6%)
Below Cutoff	8 (14.8%)	28 (51.8%)
$X^2(1, n=54) = 18.3, p < .001$		

Table 2
Attitudes and Recollections of ODS Service at Time 2

Relative to their own memories as assessed at Time 1, subjects recalled the following:

- Feeling less prepared for ODS service, $t(602)=6.29$, $p<.001$,
- Feeling more threatened at the time of service, $t(602)=2.96$, $p<.01$,
- Experiencing less stress due to environmental conditions, $t(603)=4.61$, $p<.001$,
- Being affected less by mail during ODS, $t(600)=4.45$, $p<.001$,
- Sensing less national support for their efforts, $t(605)=6.58$, $p<.001$.

In comparison to responses at Time 1, subjects indicated the following:

- Less satisfaction with personal performance during ODS, $t(602)=2.35$, $p<.05$,
- Less inclination to acknowledge stress-related symptoms as caused by ODS events, $t(603)=2.58$, $p<.05$.
- A greater feeling that they might need help to combat stress-related symptoms, $t(602)=-3.74$, $p<.001$,
- A lesser orientation toward religious support, $t(603)=6.72$, $p<.001$.

The passage of time yielded no differences in the following:

- Recollections of unit cohesion,
- Memories of nonmilitary (off-duty, domestic, etc.) stress during ODS.

Relative to their memories and responses at Time 1, *women* experienced the following:

- Recalled feeling less prepared for ODS, $t(52)=2.52$, $p<.05$,
- Remembered less national support, $t(52)=2.77$, $p<.01$,
- Indicated no other changes in attitudes or recollections.

REFERENCES

Blake, D., Weathers, F., Nagy, L., et al. Clinician Administered PTSD Scale. National Center for PTSD, Behavioral Sciences Division, Boston and Neurosciences Division, West Haven, CT, October 1990.

Bradburn, N. The Structure of Psychological Well-Being. Aldine, Chicago, 1969. Used and described in Bartone, P.T., Ursano, R.J., Wright, K.M. and Ingraham, L.H. The impact of a military air disaster on the health of assistance workers: A prospective study. J Nerv Ment Dis 177(6), 317-328, 1989.

Classen, Catherine. Stanford Acute Stress Reaction Questionnaire (SAS-Q).

Derogatis, L. and Melisaratos, N. The Brief Symptom Inventory: An introductory report. Psychol Med 13: 595-605, 1983.

Derogatis, L.R., Lipman, R.S., Rickels, K., Uhlenhuth, E.H. and Covi, L. The Hopkins Symptom Checklist. In: Pichot, P. (Ed.) Psychological Measurements in Psychopharmacology. Mod Probl Pharmacopsychiatry Vol 7. Karger, Paris, 79-110, 1974.

EPI-Q. (Floderus, B. Psychosocial factors in relation to coronary heart disease and associated risk factors. Nordisc Hygienisk Tidskrift, Suppl 6, 1974). Short version based on Form B of Eysenck Personality Inventory (EPI, Eysenck and Eysenck, 1968).

Gallops, M., Laufer, R.S. and Yager, T. Revised combat scale. In: Laufer, R.S. and Yager, T. (eds.) Legacies of Vietnam: Comparative adjustments of veterans and their peers. Vol. 3. U.S. Government Printing Office, Washington, D.C., 1981, p. 125.

Keane, T.M., Caddell, J.M., Taylor. and K.L. Mississippi Scale for combat-related posttraumatic stress disorder: Three studies in reliability and validity. J Consult Clin Psychol 56: 85-90, 1988.

Kukla, R.A., Schlenger, W.E., Fairbank, J.A., et al. (Eds.) Trauma and the Vietnam War Generation: Report of Findings from the National Vietnam Veterans Readjustment Study (NVVRS). Brunner/Mazel, New York, 1990. Information derived from questions from NVVRS.

McNair, D.M., Lorr, M. and Droppleman, L.F. Profile of Mood States (POMS). Educational and Industrial Testing Service, San Diego, 1971.

Moos, R.H. Coping Responses Inventory. Consulting Psychologists Press, Stanford, CA, 1988.

Olson, D.H., Bell, R. and Portner, J. FACES II: Family Adaptability and Cohesion Evaluation Scales. Scale available from first author at Family Social Science, University of Minnesota, 290 McNeal Hall, St. Paul, MN 55108.

Spitzer, R.L., Williams, J.B.W., Gibbon, M. and First, M.B. Structured Clinical Interview for DSM-III-R, non-patient edition (SCID-NP, version 1.0). American Psychiatric Press, Washington, D.C., 1990.

Walter Reed Army Institute of Research (WRAIR), Department of Military Psychology. Information gathered from results of instrument from WRAIR.

Weathers, F.W., Huska, J.A. and Keane, T.M. The PTSD Checklist-Military Version (PCL-M). Scale available from the first author at the National Center for PTSD, Boston VA Medical Center, 150 South Huntington Avenue, Boston, MA 02130.

Wolfe, J. and Mark, W. Operation Desert Storm Expanded Exposure Scale, 1991. Information gathered from sections of questionnaire; derived from multiple sources.

Wolfe, J., Brown, P.J. and Kelley, J.M. Information gathered from results from existing high-magnitude stressor scales.

Wolfe, J., Brown, P.J. and Kelley, J.M. Reassessing war stress: Exposure and the Persian Gulf War. J Soc Issues 49(4): 15-31, 1993. Information derived from responses given at Time 1.

U.S. ARMY SUPPORTS TO PREVENT AND MITIGATE FAMILY DYSFUNCTION DURING MILITARY COMBAT DEPLOYMENT

Joel M. Teitelbaum, Ph.D.

Walter Reed Army Institute of Research
Washington, D.C. 20307-5100

INTRODUCTION

Operation Desert Shield/Storm (ODS), the 1990-91 war with Iraq, was the first major combat action in American history in which over half (52%) of our deployed soldiers were married. Most of these married soldiers were also parents (80%). A small proportion (10%) were either single parents or members of a dual military couple with children with both parents deployed. Less than 6% of ODS soldiers had adult dependents. Similar high rates of marriage and parenthood obtained for active duty military personnel deployed to ODS from all branches of the U.S. Armed Services (Defense Manpower Data Center, 1991; U.S. Army Community and Family Support Center, 1992).

The war with Iraq demonstrated the fighting prowess of U.S. Army soldiers who deployed for several months to the Arabian desert. Once there, Army units prepared for, fought, and quickly won a major land battle while taking minimal casualties. Their successful combat mission required high levels of unit cohesion and sustained individual psychological resistance to chronic and acute stressors of a harsh, desert battlefield theater.

The Persian Gulf War also caused stress for waiting Army family members on the home front, living at Army installations or elsewhere in the United States. Spouse perceptions of family distress and of support for coping with deployment stress form the main theme of this paper on occupational military family stress in wartime. Understanding the behaviors and supports that prevented or mitigated spouse distress

and family dysfunction during the ODS combat deployment will help the Army, its soldiers, and their families prepare for occupational stressors of armed conflicts by a rapidly deployable future force.

RESEARCH ISSUES

Occupational stress research issues examined in this paper link deployment and family life events to spouse distress and support perceptions during a major combat deployment. The key question is, Do "home front" family supports reduce spouse perceptions of distress? Three research issues are analyzed:

- 1) How do Army spouses respond to combat deployment separation stressors? What spouse behaviors/perceptions contributed to functional coping with the powerful stressors of ODS deployment?
- 2) Does Army support for waiting families prevent distress or mitigate dysfunctional spouse behavior? What forms of family support or direct assistance were used frequently and perceived as helpful by ODS spouses?
- 3) Can the Army prevent psychological intrusion of family problems and distress among deployed soldiers? Do Army family supports bolster soldier psychological readiness and unit cohesion in the combat theater? How did deployed ODS soldiers perceive family well-being and unit leader caring for families during their combat mission?

The U.S. Army makes a standing commitment to achieve an "Army-Family Partnership" that promotes family well-being and coping with stress, and sustains family quality of life in the Army (U.S. Army Chief of Staff, 1983). Army deployment support programs offer help to waiting families during and after deployment missions. Support programs try to prevent or mitigate serious spouse distress and family dysfunctions that distract soldiers from their duties and degrade soldier-unit mission performance in combat theaters.

During the unpredictable and hazardous 1990-91 ODS mission, Army family support programs had three goals:

- a) Minimize controllable stressors of military origin.
- b) Sustain family well-being and quality of life during a very uncertain period of stressful soldier absence.
- c) Prepare spouses to cope with deployment and family stressors and to ease the expected strains of family reunion upon soldier return from the ODS deployment.

Two Army family support programs are tailored to achieve these goals in deploying organizations:

1) **The Family Support Group (FSG)** is a primary family support system within small military units (company/battery up to battalion). Army FSGs are mutual support associations of spouses and other soldier family members, sponsored by the unit command. Each FSG practices support actions as part of a unit training schedule, activating its support efforts fully when unit soldiers deploy.

2) **The Family Assistance Center (FAC)** is a "one-stop" Army information and referral facility at installation level operated only for deployments. The FAC assists family members of deployed soldiers by providing information on Army family resources and refers spouses and other family members to Army assistance services to help resolve their problems.

Research on these two Army support institutions examines military family stressors and extent of distress experienced by spouses of deployed soldiers. Social-psychological surveys are used to measure well-being and the support outcomes for waiting spouses. Interviews are employed to understand stress on family support-givers such as small unit level FSG leaders and volunteers, and FAC staff and volunteers at the installation level. Interviews, observations, and surveys of spouses and deployed soldiers, and interviews with installation commanders and service providers are used to evaluate spouse distress symptoms and coping behaviors.

Findings identify key deployment stressors, family social supports, and occupational stress linkages between spouses and deployed soldiers.

ODS FAMILY RESEARCH METHODS

Field data were obtained by two research methods:

a) Field interviews and observations with spouses and support-givers in ODS-deployed units and at active duty Army installations from which soldiers deployed to ODS.

b) A survey was administered to spouses (97% wives) in deployed units from several Army installations during the ODS deployment, and a follow-up survey of these spouses one year later. A larger, Army sample survey of spouses at installations world-wide taken a year after ODS also addressed ODS stress and support issues.

WRAIR administered a social-psychological survey of 1500 waiting ODS spouses from several deployed units at Army posts in the United States during the air war (early 1991) entitled "Operation Desert Shield Family Well-Being Survey" (Walter Reed Army Institute of Research, 1990). A year later, spouses who responded to this questionnaire were mailed a follow-up survey on post-ODS family conditions and perceptions of stress and support called "Operation Desert Shield/Storm Family Well-Being Survey" (Walter Reed Army Institute of Research, 1991). WRAIR surveys of deployed soldiers took place in Saudi Arabia in late 1990 shortly before the air war began, and returned soldiers received a follow-up questionnaire (Marlowe, et al., 1991). From December 1991 to February 1992, a stratified sample of 4,897 active duty spouses at installations world-wide responded to the "Survey of Army Families - SAF II" (U.S. Army Community and Family Support Center, 1992).

The two family survey methods measured stressful events and psychological symptoms and support perceived by Army spouses during the ODS deployment separation, and their perceptions of stress and support after soldiers had returned from the Persian Gulf. The two surveys also assessed spouse preparation and use of

support resources during and after ODS, perceived satisfaction with each source of support, and chronic distress and dysfunction. Results in the smaller unit spouse survey by WRAIR were confirmed by the larger Army-wide SAF-II Survey findings. WRAIR's ODS soldier surveys measured exposure to combat theater stressors, individual psychological symptoms, unit cohesion and leadership perceptions during the mission, deployed soldier family problems, and soldier perceptions of unit leader and Army caring for families.

OVERVIEW OF KEY FINDINGS

ODS family survey results showed a large majority of waiting Army spouses mobilized their informal networks of social-psychological support when faced with powerful new deployment separation stressors of the Persian Gulf War. Spouses (almost all wives) turned, for primary support, mainly to their extended families and friends in the civilian community, and to other spouses they knew in their deployed soldiers' units. Most waiting spouses also participated in unit FSG activities. Many spouses obtained assistance and mission information from their unit Rear Detachment Command during the deployment.

Although most ODS spouses (four-fifths) used their FSG, relatively few (about one-fifth) used formal Army installation assistance services while their soldiers were deployed. The only post deployment assistance agency used by up to two-fifths of spouses was the FAC. However, three-fifths of waiting spouses said they were unaware of the existence of an FAC at Army installations (Teitelbaum, 1991a; U.S. Army ODCSPER Human Resources Directorate, 1992).

FAMILY DYSFUNCTION AND SPOUSAL DISTRESS DURING ODS

A small minority of ODS spouses surveyed reported they had dysfunctional personal or family problems, including marital breakdown (6%), family violence (2%), substance abuse (2%), and/or symptoms of depression (8%). Most of these spouses also experienced serious family problems prior to ODS. A majority of seriously

distressed spouses indicated feeling psychologically isolated during ODS and lacking personal support networks. Some of them turned to Army deployment support programs and specific Army services for assistance with unresolved problems and strong feelings of distress. However, most spouses with multiple family problems were not satisfied with Army services they received. Some distressed spouses placed extra demands on the FAC and on Army employees and FSG volunteers, many of whom were also spouses of deployed soldiers (Rosen, Westhuis, and Teitelbaum, 1991b).

Occupational stress burnout due to extra demands by dysfunctional spouses affected some service provider staff and unit FSG leaders and volunteers during ODS. Burnout was highest among spouses of deployed unit leaders who served as support-givers during ODS. Some distressed spouses with chronic dysfunctional problems also transmitted their unhappy feelings and problems to their deployed soldiers by intercontinental phone calls and by letters. Their distress contributed to soldier occupational stress, distracting some soldiers from essential combat theater duties, and reducing small group cohesion in deployed units. Deployed ODS soldiers with serious family problems at home reported more severe psychological symptoms and had reduced psychological resistance to combat stress syndrome risk (Teitelbaum, 1991b; Marlowe, Gifford, and Wright, 1991).

DEPLOYED SOLDIER MARITAL INSTABILITY

Marital instability and conjugal splits among Army couples were widely discussed issues during and after the ODS deployment separation. Rumors spread within some units and across deploying installation communities about sudden high levels of ODS-induced marital separation and divorce. Exaggerated news stories were publicized by U.S. electronic and newspaper media about excessive cases of "ODS marriage casualties" thought to have been caused by the stress of the Persian Gulf War mission. Marital infidelities by spouses at home or by soldiers in the combat theater were ascribed to the lengthy deployment separation. Deployed soldiers heard rumors and gossip about marriages breaking up while they were away. When these soldiers returned from ODS, rumors spread within their units and installation communities of

high rates of marital breakdown and divorces due to the ODS deployment (Applewhite and Segal, 1990).

However, on-site family interviews and ODS spouse and soldier surveys revealed that divorce and marital estrangement actually declined during ODS. Documents collected from county courthouses surrounding deploying Army installations showed the following pattern of divorce and legal separation during and after ODS:

a) The divorce rate declined precipitously for soldiers in deployed units during ODS compared to peacetime divorce rates in these units. Both legal divorce proceedings and new marriages were not permitted during the soldier's wartime absence (Teitelbaum, 1991a; U.S. Soldiers and Sailors Wartime Act, 1943).

b) A spurt of "deferred divorces" took place after ODS, peaking in the first three months after most soldiers returned from the combat theater. This temporary rise in divorce fueled misinformation about excessive numbers of post-deployment divorces among ODS Army personnel. Soldier and spouse surveys demonstrated that divorce rates a year after the return from ODS were close to the pre-ODS level of 5.6% per annum. A small percentage of ODS soldier couples who divorced in the year after ODS (6.3%) was similar to the divorce rate for non-deployed soldiers after ODS (Rosen, Teitelbaum, Westhuis and Durand, 1993; Teitelbaum, 1993).

The frequency of divorces and legal separations remained significantly higher among the small minority of Army spouses who experienced chronic distress or serious family problems during ODS. One-third of these spouses said they had considered divorce before their soldiers deployed to the Persian Gulf; they were involved in almost half of the completed divorces that eventually took place after ODS. Many of these spouses also reported high levels of stressful life events during ODS (Rosen, Westhuis, and Teitelbaum, 1991a). Deployed soldiers who reported marital problems were more likely to be distracted from their ODS mission, displayed more psychological symptoms and had reduced resistance to combat theater sources of stress. They reported lower unit cohesion scores and lower confidence in unit leader caring for families and in Army support for waiting spouses (Marlowe, Gifford, and Wright, 1991).

DEPLOYMENT STRESSORS AND FAMILY SUPPORT USE

ODS spouse survey results show that loneliness and fear for the deployed soldier's safety and well-being in the combat theater were the dominant emotional stressors, affecting 90% of waiting ODS spouses. The most powerful family life stressor events affecting waiting ODS wives included the following: 21% were pregnant and/or gave birth during the ODS period; 27% reported serious family financial problems associated with ODS; 15% had problems with children; and 11% reported serious illness or death of an extended family member.

Most spouses turned to their family (71%) and civilian friendship networks (65%) for emotional and practical help. No increase above normal peacetime levels occurred in ODS spouse utilization of Army programs targeted at specific dysfunctional family problems: mental health counseling or treatment, and Substance Abuse and Family Advocacy programs. ODS spouse use of Army chapels and chaplaincy programs did not rise, but one-third of these spouses (34%) engaged in increased off-post religious activity while the soldiers were away.

Waiting ODS spouse use of selected Army services rose compared to peacetime. The greatest increases occurred in Army medical clinic visits and recreation or sports (Army Morale, Welfare and Recreation Programs). Analysis of survey data showed that spouses who reported using such programs in ODS also reported lower levels of distress from both deployment and life event stressors (Rosenberg, 1992; Teitelbaum, 1993).

ODS STRESS PREVENTION AND MITIGATION

Controlled statistical analysis of the ODS Family Well-Being Survey (Rosen, 1992) showed positive social-psychological effects from Army supports among ODS spouses. Stressful life events reported by spouses during ODS were fewer, and their levels of distress and dysfunction were mitigated by positive spouse perception of Army

and personal social support activities. ODS spouses who reported fewer family psychological symptoms also reported improved coping responses and well-being.

The most frequent stress-reducing actions used by waiting spouses were telephone calls and letters they exchanged with their deployed soldiers. Most spouses turned to their own extended families and friends for informal support. These spouses adjusted better to the uncertain wartime separation caused by ODS than those who lacked networks. Accurate Army information spouses received about the unit mission in ODS and the living conditions and health of deployed soldiers also helped prevent spouse deployment distress. The most frequent information source (90%) was the ODS-deployed soldier. Others used frequently were unit FSGs (76%) and unit Rear Detachment Commands (70%). Family Assistance Centers and family briefings by post commanders were used by 40% of spouses to obtain helpful deployment information (Teitelbaum, 1991a).

Survey analysis, confirmed by field observations and on-site interviews, demonstrates that over nine-tenths of waiting spouses did not become seriously distressed during ODS. Social support and accurate information helped them to function during the separation period. Most ODS spouses coped with powerful emotional stressors and demanding life events, and handled their daily finances and household hassles. Their primary emotional and instrumental support came from their own informal networks of close friends and families, from other unit spouses and from unit FSG activities and information. Very few sought help from formal Army assistance agencies. For this large majority of ODS spouses, reunion with the returning soldier after ODS was usually positive, and marital and family re-adjustment occurred rapidly and smoothly.

These findings indicate that a combination of informal support networks and primary Army family supports made for successful family coping during and after ODS (Rosen, Westhuis and Teitelbaum, 1991b).

UNIT FAMILY SUPPORT GROUPS

The small unit FSG was used by almost as many ODS spouses as was personal contact with the deployed soldier and extended family and friend networks. However, FSGs varied widely in spouse-perceived family supportiveness from one small unit to another. The best FSGs functioned like informal social support networks among friends. Spouse involvement and satisfaction was more likely where FSG leaders and volunteers were drawn from all ranked groups. Spouse views of FSG support were most favorable in units where the command de-emphasized soldier rank distinctions among spouses and FSG leaders encouraged egalitarian activities and peer support among family members.

ODS spouses reported that about two-fifths of their units contained FSGs established prior to the Persian Gulf mission; these FSGs were typically found in units accustomed to regular deployments before ODS. Spouses reported that established FSGs were more helpful sources of ODS support and information than new FSGs formed at the beginning of the ODS deployment or inactive FSGs. One-fourth of spouses said there was no FSG in their unit before ODS. A third said an FSG existed before ODS, but since the group was inactive, they did not participate in it.

The frequency of spouses reporting an active FSG during ODS doubled from two-fifths to four-fifths of unit spouses in our surveys. Half of these FSGs were newly formed for the ODS mission and led by spouses of unit leaders. These "command-led" FSGs lacked a democratic support culture found in units that had practiced family support before ODS via established "volunteer-led" FSGs with egalitarian participation.

An established FSG performed four main functions:

- 1) Held regular information or training briefings.
- 2) Promoted unit-wide soldier-family social events.
- 3) Mailed an FSG-unit newsletter to all unit spouse.

4) Ran a telephone contact system, the FSG "telephone tree" chain, operated by volunteer FSG spouses.

In response to the unit deployment alert for ODS, most established FSGs quickly mobilized their existing volunteer resources to inform member spouses about the deployment, provide emotional comfort to one another, and to assist spouses with personal emergencies. FSG volunteer "telephone trees" disseminated unit command-authorized, accurate information to nearly all waiting spouses as rapidly as possible. Regular FSG meetings and rapid "telephone tree" voice contacts helped to dispel false rumors and to correct media misinformation about soldier living conditions in the Arabian desert during ODS. These FSG functions reduced spouse fears for deployed soldier safety and well-being. FSGs aided spouse coping with rumors passing from some deployed soldiers to their spouses on imaginary theater dangers or problems. Accurate FSG information helped control malicious rumors about spouse or soldier marital infidelities (Teitelbaum, 1991c).

Survey analysis showed that volunteer-led FSGs were considerably more successful at preventing and reducing spouse distress than were command-led FSGs. Volunteer-led FSGs attracted three times as many waiting spouses to participate, and by a two-to-one ratio, spouses reported volunteer-led FSGs were more effective stress-reducers than command-led FSGs (Teitelbaum, 1991b).

Spouses who participated in a volunteer-led FSG experienced significantly fewer distressful deployment events than those in command-led FSGs lacking a positive unit family support climate. They also coped better with a variety of life stressors during the deployment period. Fewer spouses who served as leaders of well-established FSGs reported burnout caused by excessive demands of dysfunctional families in the unit. Spouse leaders of command-led FSGs more frequently reported feeling obliged to participate as "mandatory volunteers" due to their soldier's leadership role in the unit chain of command. These volunteers were more likely to report psychological burnout trying to assist overly dependent spouses with multiple unresolved problems during ODS (Rosen, Westhuis and Teitelbaum, 1991b; Teitelbaum, 1991c).

Parallel surveys of deployed unit soldiers in Saudi Arabia showed that soldiers who perceived a positive family support unit leadership climate had fewer serious family problems during ODS. These soldiers were more confident that their FSG was "taking care" of unit families. They also reported higher cohesion scores and had higher levels of individual psychological resistance to ODS battlefield stressors (Marlowe, Gifford, and Wright, 1991).

THE SUPPORT ROLE OF THE FAMILY ASSISTANCE CENTER IN ODS

Family Assistance Center programs consist of mandated social services provided at most active duty Army installations by Army Community Services (ACS). Army Community Services offer soldiers with family members two basic kinds of deployment assistance:

1) Helps establish FSGs in Army units and trains unit leaders, FSG leaders, volunteers, and family members to prepare for and cope with Army deployment separations.

2) Designs and operates a "one-stop" information and assistance facility for families at Army posts during deployment missions, the FAC, providing waiting families with information and referrals to ACS and other Army program assistance, as appropriate.

Spouse use of and satisfaction with the FAC was assessed at several Army posts visited by researchers during ODS. An Operation Desert Shield Family Well-Being Survey (WRAIR, 1990), followed by an ODS Family Well-Being Follow-up Survey, (WRAIR, 1991), and the Survey of Army Families - SAF II (CFSC, 1991-92) confirmed on-site field observations by WRAIR researchers, as follows:

On average, 40% of ODS spouses had visited or phoned an FAC at their installation. However, only 14% reported using an FAC to solve a family problem before or during ODS. Two-thirds of users were satisfied with FAC help. Family Assistance Centers were used by a minority of waiting ODS spouses, most of whom

said FAC support was satisfactory. Satisfied FAC users felt more satisfied with Army family life. However, the mere presence of an FAC on post did not raise spouse satisfaction (Rosenberg, 1992; Teitelbaum, 1991b).

Field observations and review of telephone bank logs indicated that FACs fulfilled key informational roles on behalf of extended family members and close friends of soldiers living far from the soldier's duty station. The FAC phone bank provided a free long-distance phone number. Volunteers worked FAC phone-bank shifts up to 24 hours a day delivering accurate ODS information to callers. One-fourth (24%) of waiting spouses moved away from their Army homes during the ODS separation period. Many of these spouses used the FAC phone bank for information. FACs gave information and made referrals to Army services and special benefits for family members of deployed soldiers. Installation command family briefings, often organized through the FAC, provided updated information and answered questions from waiting family members. FAC phone banks also gave helpful ODS information to parents and friends of deployed soldiers (Teitelbaum, 1991b; CALL, The Yellow Ribbon, 1991).

SUMMARY OF FINDINGS

Previous Army field studies of spouses during unit deployments (Wood and Gravino, 1987; Teitelbaum, 1990) and ODS family surveys (Rosen, Westhuis, and Teitelbaum, 1992) have shown that most Army spouses faced with deployment separation stressors seek primary emotional support from their deployed soldiers and from personal networks composed of extended family, and friends in civilian communities. They also seek out spouses in their small units and the unit FSG.

Most waiting spouses who had an informal support network functioned well during ODS, and most of them felt adequately supported by the Army. However, a minority of spouses who lacked a personal support network experienced excessive psycho-social isolation and high levels of distress or dysfunction during ODS. Many distressed spouses became excessively dependent on Army family support-givers and felt that Army support was inadequate. Their demands caused psychological burnout among some support-givers, especially spouses of deployed personnel.

Family supports that most spouses viewed as helpful in coping with ODS stress are rank-ordered as follows:

- 1) Reliable communication, giving spouses direct access by phone or mail to deployed soldiers, especially international phone links and Army/U.S. postal services.
- 2) Waiting spouse social networks, which offered primary support through extended families and friends.
- 3) Family Support Groups established in small units, especially volunteer-led FSGs with a democratic support culture backed by their unit chain of command leadership.
- 4) Installation deployment information and referrals to spouses, especially the post FAC and FAC phone banks, as well as command family briefings.
- 5) Specific Army installation programs for families (medical and recreational), used more frequently by waiting spouses during ODS.
- 6) Army programs targeted for families with serious problems, used least frequently and not found as helpful as other sources of support, which is no different than before this major deployment.

Deployed soldiers who were married and soldiers with children at home were more aware of Army family support and caring during ODS than were single soldiers in their units. Married soldiers whose families remained at post during ODS reported higher levels of personal confidence in their unit FSG than did soldiers whose families moved away from the post for ODS (Gifford and Wright, 1991).

Few ODS soldiers were aware of the existence of the post FAC or how helpful it was to families. Unlike FSGs, which became established in small units before ODS, the FAC did not operate during peacetime training exercises. Almost all ODS soldiers (and a majority of their spouses) were unfamiliar with FAC support. ACS and Army services targeted at problem families were hardly used during ODS.

CONCLUSIONS AND IMPLICATIONS

In our family-oriented, all-volunteer U.S. military force, both informal and Army supports that prevent or mitigate familial stressors for most Army personnel contribute to spouse well-being. Successful family support raises unit cohesion and readiness during a combat mission such as ODS. A key ODS "lesson learned" is that both family member distress and well-being are easily communicated by waiting spouses to their deployed soldiers. Soldier psychological readiness and unit cohesion degrade when serious spouse distress or family dysfunctional problems intrude in the combat theater. Deployed soldier confidence and unit cohesion are enhanced by communication with spouses. Perceptions of Army caring and unit and installation support for waiting families raises deployed soldier psychological readiness.

Timely and accurate Army information to spouses and other family members, and family-unit supports informally and through the FSG, are primary approaches to prevent stressful life events and mitigate deployment distress perceptions among most spouses. A secondary source of prevention is accurate information and problem-solving referral by the FAC, which enhances spouse satisfaction with Army life during a deployment separation. However, the FAC did not contribute to ODS soldier psychological resistance or cohesion in the combat theater as it was not part of their culture of support before the mission.

A small minority of chronically dysfunctional or distressed spouses tend to overuse some support-giver resources available during deployments. Dysfunctional spouses can cause occupational stress for FSG leaders and FAC volunteers and employees, some of whom experienced psychological burnout as support-givers during ODS. Dysfunctional family problems often pre-existed the deployment separation. Services for problem families were not used frequently during ODS and were not key factors preventing or mitigating deployment stressors.

The most frequent and powerful deployment stressors during ODS were emotional in nature: spouse loneliness and fear for the well-being of their deployed soldier. Spouse coping with these deployment stressors was most effective among

spouses who communicated with their deployed soldiers, had informal support networks and used some Army support programs more frequently: Army health care services, installation sports and recreation and, especially, their unit FSG. Volunteer-led FSGs and accurate Army information were the key family support resources most spouses felt helped them overcome their fears from false rumors about soldier return dates, family breakup and divorce. Most waiting spouses coped well with powerful deployment stress perceptions by utilizing support resources (Rosen, Westhuis, and Teitelbaum, 1991a; Wood and Gravino, 1995).

In conclusion, established Army support institutions prevent and mitigate family distress. Primary supports in the unit minimize family dysfunction before, during, and after major Army deployment separations such as ODS. Volunteer-led FSGs are crucial primary support resources for married soldiers and soldiers with children at home. This unit-family bond promotes increased spouse coping and raises soldier confidence in the FSG and in unit chain-of-command caring for families. An effective FSG bolsters deployed soldier resistance to psychological symptoms of combat stress and helps raise their unit cohesion on the battlefield. FSGs also contribute to soldier marital stability during and after deployments.

Secondary (installation-level) deployment support resources, such as the FAC, help inform widely dispersed members of soldier families. The FAC can guide waiting spouses to Army services that help resolve family member problems and mitigate dysfunctional familial distress.

Both primary and secondary Army family supports are most effective for spouses and deployed soldiers when they function in tandem. Training and preparation of soldiers and family members in peacetime about available social supports for deployments can maximize occupational stress prevention in deployed Army units. Preparedness and advance awareness of primary and secondary support institutions are key to the successful prevention and reduction of occupational stress in deploying Army units.

REFERENCES

- Applewhite, L.W. and Segal, D. Telephone Use by Peacekeeping Troops in the Sinai. Armed Forces and Society. 17 (1): Fall 1990.
- CALL (Center for Army Lessons Learned). The Yellow Ribbon. Fort Leavenworth, KS, June 1991.
- Defense Manpower Data Center. Demographics of Deployed ODS Service Personnel. DMDC, Monterey, CA, 1991.
- Gifford, R.K., Martin, J.A. and Marlowe, D. Operation Desert Shield: Adaptation of Soldiers during the Early Phases of the Deployment to Saudi Arabia. Department of Military Psychiatry, WRAIR, Washington, D.C., 1991.
- Gifford, R.K. and Wright, K.M. Building Cohesion in the Desert: Observations of Army Units in Operation Desert Shield. (Manuscript) Department of Military Psychiatry, WRAIR, Washington, D.C., 1991.
- Marlowe, D.H., Gifford, R.K. and Wright, K. Human Research in Operation Desert Shield/Storm. Department of Military Psychiatry, WRAIR, Washington, D.C., 1991.
- Marlowe, D.H. and Gifford, R.K. The Psychological Aftermath of Operation Desert Shield/Storm. Inter-University Seminar, Fort Myer, VA, October 29, 1992.
- Rosen, L.N. and Moghadam, L.Z. Social Support, Family Separation and Well Being Among Military Wives. Behav Med, 14: 64-70, 1988.
- Rosen, L.N. and Moghadam, L.Z. Impact of Military Organization on Social Support Patterns of Army Wives. Human Organization, 48 (3): 189-195, 1989.
- Rosen, L.N. and Moghadam, L.Z. Can Social Supports be Engineered? An Example From the Army's Unit Manning System. J Appl Soc Psychol, 19 (15), part I: 1292-1309, 1989.

- Rosen, L.N. Stress Mediators for Army Spouses Surveyed During Operation Desert Shield/Storm. Department of Military Psychiatry, WRAIR, Washington, D.C., 1991, No. 39.
- Rosen, L.N., Carpenter, C.J. and Moghadam, L.Z. Impact of Military Life Stress on the Quality of Life of Military Wives. Mil Med, 154 (3): 116-20, 1989.
- Rosen, L.N., Westhuis, D.J. and Teitelbaum, J.M. Stress and Coping Among Army Wives During Operations Desert Shield and Desert Storm. Department of Military Psychiatry, WRAIR, Washington, D.C., 1991a, No. 360.
- Rosen, L.N., Westhuis, D.J. and Teitelbaum, J.M. Patterns of Adaptation Among Army Wives During Operation Desert Shield and Desert Storm. (Manuscript) Department of Military Psychiatry, WRAIR, Washington, D.C., 1991b.
- Rosen, L.N., Westhuis, D. and Teitelbaum, J.M. Life Events, Social Supports and Psychiatric Symptoms Among Spouses of Soldiers Deployed to the Persian Gulf as Part of Operation Desert Shield/Storm. Presented at the 145th Annual Meeting of the American Psychiatric Association, Washington, D.C., May 1992.
- Rosen, L.N., Teitelbaum, J.M., Westhuis, D.J. and Durand, D.M. Army Family Stress and Divorce in Operation Desert Shield/Storm. WRAIR, 75th Anniversary Poster Session, Washington, D.C., October 1993.
- Rosenberg, F.L. In-Depth Analysis of the Survey of Army Families II (1991-1992). Department of Military Psychiatry, WRAIR, Washington, D.C., 1992.
- Teitelbaum, J.M. Family Support in Army Combat Units. Department of Military Psychiatry, WRAIR, Washington, D.C., Unit Manning System Technical Report No. 5, 1988.
- Teitelbaum, J.M. Deployability of Soldiers with Families. Department of Military Psychiatry, WRAIR, Washington, D.C., Technical Report, 1990.

Teitelbaum, J.M. Unit Support for Spouses of the Deployed: Rear Detachment Commands and Family Support Groups. Department of Military Psychiatry, WRAIR, Washington, D.C., 1991a, No. 42.

Teitelbaum, J.M. Army Family Stress, Support, and Coping in Operation Desert Shield/Storm. Presentation at Military Testing Association, San Antonio, TX, 1991b.

Teitelbaum, J.M. Effectiveness of Family Support Groups for Deployment Separation Operation Desert Shield/Storm. Inter-University Seminar on Armed Forces and Society Conference, Baltimore, MD, October, 1991c.

U.S. Army Chief of Staff. Chief of Staff's White Paper on the Army Family. The Pentagon, Washington, D.C., 1983.

U.S. Army Community and Family Support Center. The Army Family Action Plan, 1991-92. Alexandria, VA, 1992.

U.S. Army Community and Family Support Center. Survey of Army Families II. Alexandria, VA, 1991.

U.S. Soldiers and Sailors Wartime Act. United States Congress, 1943.

U.S. Army Community and Family Support Center. Total Army Family Support Program. Alexandria, VA, 1993, USAR PAM 608-20 Revised.

U.S. Army ODCSPER Human Resources Directorate. Family Factors in Operation Desert Shield/Storm In-Process Review. The Pentagon, Washington, D.C., April 29, 1992.

Vernez, G. and Zellman, G.L. Families and Mission: A Review of the Effects of Family Factors on Army Attrition, Retention, and Readiness. Santa Monica, CA, August, 1987, RAND NOTE N-2624-A.

Walter Reed Army Institute of Research. Operation Desert Shield Family Well-Being Survey. Department of Military Psychiatry, WRAIR, Washington, D.C., 1990.

Walter Reed Army Institute of Research. Operation Desert Shield/Storm Family Well Being Survey. Department of Military Psychiatry, WRAIR, Washington, D.C., 1991.

Wood, S., Scarville, J. and Gravino, K.S. Waiting Wives: Separation and Reunion Among Army Wives. Armed Forces and Society, 21 (2): 217-236, Winter 1995.